FLIGHT

MAGAZINE

AUGUST 1960

50 cents

THE LIBRARY OF CONGRESS SERIAL RECORD
AUG 23 1960
Copy

De HAVILLAND DOVE CUSTOM 800

(See page 22)

. . . no spot is isolated from the new **BELL 47G-3**

Nimble as a mountain goat, this Bell carrying a 1,000 pound useful load can skip over mountain tops with the ease born of a 23,000 foot plus service ceiling. It's just as at home down below, skimming the valleys or hot steamy swamps . . the one helicopter that simplifies a multitude of jobs. The 47G-3 is the first helicopter to meet the new stringent regulations of the U.S.A. Federal Aeronautic Administration. ■ *Bell's 47G-3 carries a big, proven rotor system, same as the world-famous Bell 47J's. Parts are interchangeable with those in existing Model 47 Bell equipment. The ship is powered by a Franklin turbo-supercharged engine, offering the most economical operation of any helicopter in its class.* ■ *Rugged as it is, the 47G-3 is lower in initial and operating costs. It flies 1200 hours between overhauls . . longer than any other helicopter and at a lower parts replacement cost than any other model.* ■ *Write for full information or see your Bell distributor or charter operator about the 47G-3 . . newest member in a long line of Bell helicopters.*

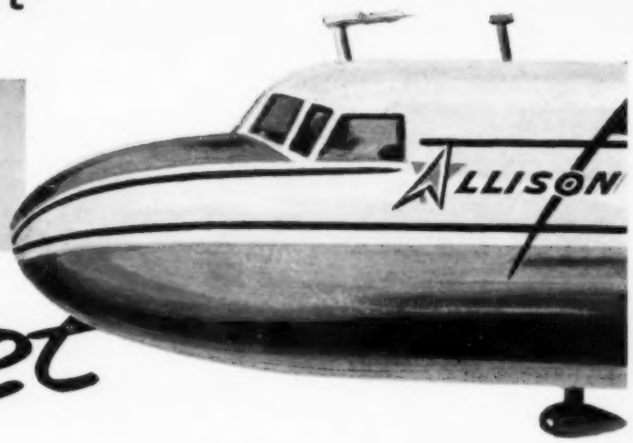
BELL
HELICOPTER COMPANY

DIVISION OF BELL AEROSPACE CORPORATION • FORT WORTH, TEXAS • A TEXTRON INDUSTRY

AUG 18 1960

Economical Jet Age Aircraft

ALLISON Prop-Jet CONVAIR



Are jet-age prices keeping you from filling your jet-age needs?

Then take a good look at Allison Prop-Jet Convairs and meet jet-age competition for short- and medium-range service at a fraction of what you'd pay for comparable new aircraft.

Performance? FAA-certificated Allison Prop-Jet Convairs cruise at speeds up to 350 mph. Block speeds are increased 25% to 30%. Rate of climb at sea level is tripled–3000 feet per minute.

FOR CORPORATE AIRCRAFT OPERATORS–The Allison Prop-Jet Convair means less executive travel time, more time for business on important trips.

And because it has power to fly above most foul weather, the Allison Prop-Jet Convair virtually eliminates delays and missed appointments.

FOR AIRLINES – Route analyses of several airlines reveal this jet-age plane will yield a 19% to 48% return on invested capital. Seating capacity ranges all the way up to 66 passengers.

Then, too, there's the added sales appeal of high-speed flying at low noise and vibration levels – giving your passengers the benefit and pleasure of modern jet-age transportation.

FOR ANY AIRCRAFT OPERATOR–The Allison Prop-Jet Convair means matching jet-age competition–and improving the profit picture. For details–or a free analysis of *your* aircraft operations–plus the full story on our Unit Exchange Program, write on your letterhead to:

Mr. E. M. Deckman
Manager, Sales and Contracts Dept. 2C
Aircraft Engines Operations,
Allison Division, General Motors Corporation
Indianapolis 6, Indiana.

GM
JET POWER

ALLISON PROP-JET POWER

FLIGHT NO.	ARRIVAL TIME
F-27-16	~~5:27~~ ON TIME
F-27-7	~~5:34~~ ON TIME
F-27-14	5:40 ON TIME
F-27-22	6:15 ON TIME
F-27-12	6:27
	6:50

Operation Dependability. The Fairchild F-27 is the propjet airlines rely on. Its modern equipment assures dependable operation and permits pilots to select the smoothest, most direct course to their destination. Outstanding short field capabilities enable it to serve more airports than any aircraft in its class. This is the Fairchild F-27, propjet with on-time dependability.

FAIRCHILD *F-27*

FAIRCHILD ENGINE & AIRPLANE CORPORATION • HAGERSTOWN, MARYLAND

Serving these progressive airlines:

AREA / AVENSA / ALOHA / BONANZA / NORTHERN CONSOLIDATED / OZARK / PACIFIC / PIEDMONT / QUEBECAIR / TRANS mar de CORTES / WEST COAST / WIEN

FIRST IFR HELICOPTER TYPE CERTIFICATE ISSUED BY FAA has been awarded to the 4-place Cessna CH-1C, a 4-place copter which Cessna will soon market commercially. IFR certification permits CH-1C operations in weather minimums equivalent to those for single-engine fixed-wing aircraft, opening the door to increased copter utilization. Cessna says the CH-1C IFR model incorporates a special stability control system which does not rely on electronic devices for handling characteristics to meet IFR requirements. The Cessna is powered by a supercharged, fan-cooled Continental FSO-526A engine rated at 270 hp. net at 3,000-3,200 rpm. up to 8,000 ft.

AIR Report
Significant Trends and News

REVOLUTIONARY NEW LIGHT TWIN is being perfected by Cessna Aircraft for maiden flight early next year and commercial marketing in 1962. Cessna Vice President Del Roskam revealed it is of "completely different design" from conventional light twins and marks Cessna's entry in the "light-light twin market," obviously as a competitor to Piper's Apache, which has outsold all light twins. Roskam said his new little 4-place twin will be designed for high performance "with all the simplicity and flying ease of a single-engine aircraft, operating with a substantial margin of safety on either or both engines." He declined to reveal details of the configuration or specific performance but said it would out-perform anything in its class. He said, however, that the radical Cessna design "will present a basic new approach to twin-engine aircraft philosophy and will set a new pattern of thinking and engineering to meet the challenge of changing times and needs." (Editor's Note: This statement obviously narrows Cessna's secret down to two possible configurations — (1) a twin with a tractor engine and prop on the nose plus a pusher engine and prop on the same thrust line behind the cabin, with a twin-boom tail or (2) a twin with two engines driving a single prop through a clutch for disengaging one engine and its drag for single-engine operation. Since Beech once experimented unsuccessfully with the latter arrangement in the nose of a Bonanza, Cessna apparently will develop the tandem-engine configuration, the 4-place cabin separating the fore and aft engines. With both engines on the same center thrust line, engine-out yaw would be eliminated along with the requirement for a multi-engine pilot rating.)

BEECH AIRCRAFT'S TOP-MANAGEMENT REALIGNMENT, expected in recent months, got under way last month with John P. Gaty announcing his resignation effective Sept. 30 as vice president and general manager. Gaty will be 60 in Septem-

(Continued on next page)

FLIGHT MAGAZINE

AUGUST, 1960 VOL. 49, No. 8

THIS MONTH'S COVER highlights changes which distinguish the new de Havilland Custom 800 Dove — a higher cockpit dome with larger side windows and large new exhaust augmentors. Its 6-cylinder, supercharged and fuel-injected Gipsy Queen 70 Mark 3 engines are rated at 400 hp. each for take-off. Custom 800 features roomier cockpit for crew of two and customized 6-seat executive cabin interior.

—(FLIGHT MAGAZINE Photo.)

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIALS: OUR DISAPPEARING AIRPORTS; A POINT-FOUR PLAN FOR CIVIL AVIATION 17

New Custom 800 de Havilland Dove—MORE HORSEPOWER, SPEED AND RANGE FOR POPULAR TWIN 22

Lake L-4 Amphibian—LONGER HULL WITH V BOW FOR FOUR-PLACE PUSHER 24

Simple Bellows System Keeps Wings Level—GRISWOLD LATERALIZER USES WINGTIP AIRFLOW AS REFERENCE 26

Private Airports Can Make Money—BY GEORGE E. HADDAWAY—ADDISON AIRPORT FOR BUSINESS FLIERS OFFERS FORMULA . . 28

IFR Training for Non-Rated Pilots—A Deadly Fallacy by FAA Theorists—BY JOSEPH E. COULTER—AUTHORITATIVE DISCUSSION OF DANGERS IN NEW REGULATION FOR STUDENT TRAINING 30

True Airspeed Indicator—SIMPLE UNIT CORRECTS FOR TEMPERATURE AND ALTITUDE 31

More Work for Helicopters—SKY HOOK FOR LIFTING MATERIALS AND AERIAL RECOVERY OF PARACHUTED PACKAGES 34

VOR-DME Pictorial Navigation—MOVING BUG TRACES AIRCRAFT TRACK 42

Umbaugh's Promise—AMBITIOUS AUTOGYRO PROGRAM 43

New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 48

Airmen's Calendar—COMING EVENTS 53

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

FLIGHT MAGAZINE, August, 1960, Vol. 49, No. 8. Published Monthly. Publication Office, P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas. Price 50 cents single copy. Subscription rates: United States, one year, $3.00; two years, $5.00; three years, $6.00. Established February, 1934. Entered as second-class matter at the Post Office, Dallas, under the act of March 3, 1879.

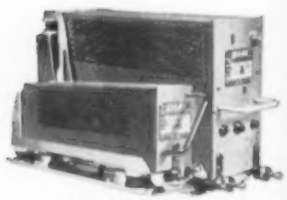
Copyright, 1960, by Air Review Publishing Corporation.

Complete Nav-Comm Systems from DARE

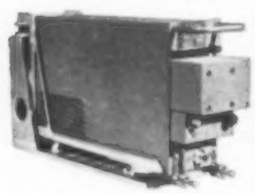
Meet FAA-TSO Requirements

You get all-channel capability—lower current drain—lighter weight—and lower cost with this complete, all-Dare Communications and Navigation System. Every component has been designed for reliable operation to airline standards. Every unit meets exacting FAA-TSO and FCC requirements. Your Dare distributor will be glad to demonstrate the complete system—or any part of it.

DTR-360 B—360 Channel, 20-Watt Communications System



DN-560—560 Channel VHF Navigation System



DADF-1—LF and MF Automatic Direction Finder

DGS-20—Glide Slope Navigation Receiver

DM-3—Marker Beacon Navigation Receiver

COMING SOON! The New Dare DTX-10—a 10-watt standby VHF transmitter with up to 360 channels.

DARE INC.—TROY, OHIO

Designers and manufacturers of aircraft communications and navigation systems; and military electronic equipment.

500,000th PASSENGER carried by Chicago Helicopter Airways was Mayor Richard J. Daley (left, above), shown with C. W. Moore, CHA executive vice president. CHA carried 31,951 passengers during June on its scheduled helicopter trips, operating Sikorsky S-58's as one of three helicopter airlines in the U. S.

ber and will devote full time to personal business interests after resigning — he has extensive real estate and oil producing holdings. A week following Gaty's announcement, Mrs. Olive Ann Beech announced election of Frank E. Hedrick as executive vice president and election of James N. Lew as vice president of engineering. Hedrick has been a Beech employee since 1940 and has been vice president-coordinator since 1945 and Lew, also with Beech since 1940, has been vice president in charge of all Beech military activities. Hedrick's elevation had been expected since Mrs. Beech announced some months ago plans to expand the Beech line of commercial

PICTORIAL JOURNALISM'S HIGHEST HONOR, the Joseph A. Sprague Memorial Awards, were presented last month by the National Press Photographers Association to Major W. J. Lookadoo (right, below) chief of the U. S. Air Force information pictorial branch, and Kenneth P. McLaughlin of the San Francisco Chronicle (left). Center is Joseph Benetti of the Sacramento Union, president of NPPA.

SKY TRAVEL INC. at Houston International...

...Prompt service for flyers in a hurry

"People fly because they're in a hurry, so we give fast, efficient ground service to save the flyer's time," says SKY TRAVEL President Charles Groce.

SKY TRAVEL offers 24-hour line service, hangar storage, Humble Aviation Gasoline grades 80, 91, 100, 115 and Turbofuel 1-A. Catering service and direct phone lines to all major airport facilities are available.

Call in on UNI-COM 123.0 and arrangements for service, food and transportation to town will be complete when you taxi in.

SKY TRAVEL specializes in complete maintenance service. It has modern equipment, seventeen licensed A. & E. mechanics and fifteen years of experience . . . since 1945!

When you map your stops at the Humble sign, you get the best fuels and lubricants, *and the best service!*

HUMBLE OIL & REFINING COMPANY

HUMBLE

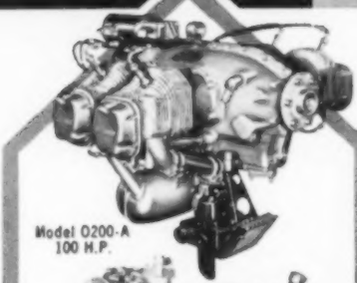
AVIATION PRODUCTS

The buyer of an airplane with

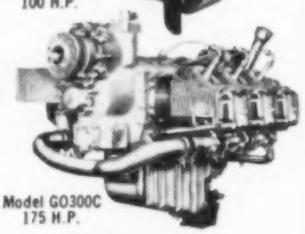
CONTINENTAL POWER

obtains two plus values available nowhere else. One is Continental's famous reliability; the other, the priceless backing of genuine Continental parts and factory-approved service no matter where he may fly.

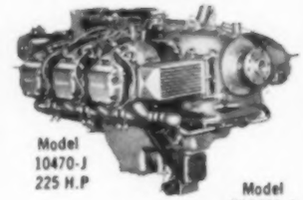
After engine dependability, the most important thing to consider in choosing an airplane is the service behind it—the facilities maintained by its makers to keep it in the air at lowest cost. And here, as on the basic score of engine stamina, planes with Continental power rate uniformly high . . . Owners of such aircraft are sure of finding genuine Continental parts and competent mechanics the world over . . . They benefit in other ways, too, from Continental's policy of backing those who build and those who use Continental-powered products.



Model O200-A
100 H.P.

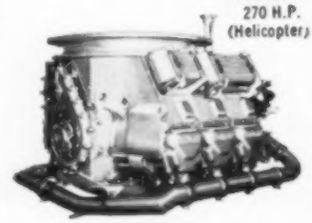


Model GO300C
175 H.P.



Model
10470-J
225 H.P.

Model
FSO526-A
270 H.P.
(Helicopter)



21 MODELS
65 TO 340
HORSEPOWER

MODEL	HP	RPM	CYL.	WT.	OCTANE
A65	65	2300	4	173	80/87
C90	95	2625	4	207	80/87
O200-A	100	2750	4	190	80/87
O300-A B & C	145	2700	6	277	80/87
GO300-C	175	3200	6	312	80/87
O470-15***	213	2600	6	405	80/87
E225	225	2650	6	363	80/87
O470-K & L	230	2600	6	404	80/87
O470-M	240	2600	6	409	91/96
O470-G	240	2600	6	432	91/96
O470-H*	240	2600	6	472	91/96
I0470-C	250	2600	6	432	91/96
I0470-D	260	2625	6	426	100/115
I0470-F	260	2625	6	426	100/130
I0470-J	225	2600	6	402	80/87
I0470-K	225	2600	6	391	100/130
FSO526-A**	270	3200	6	575	91/96
GSO526-A	340	3100	6	549	91/96

*Pusher Type engine with extended propeller shaft
**Helicopter engine ***For Military use

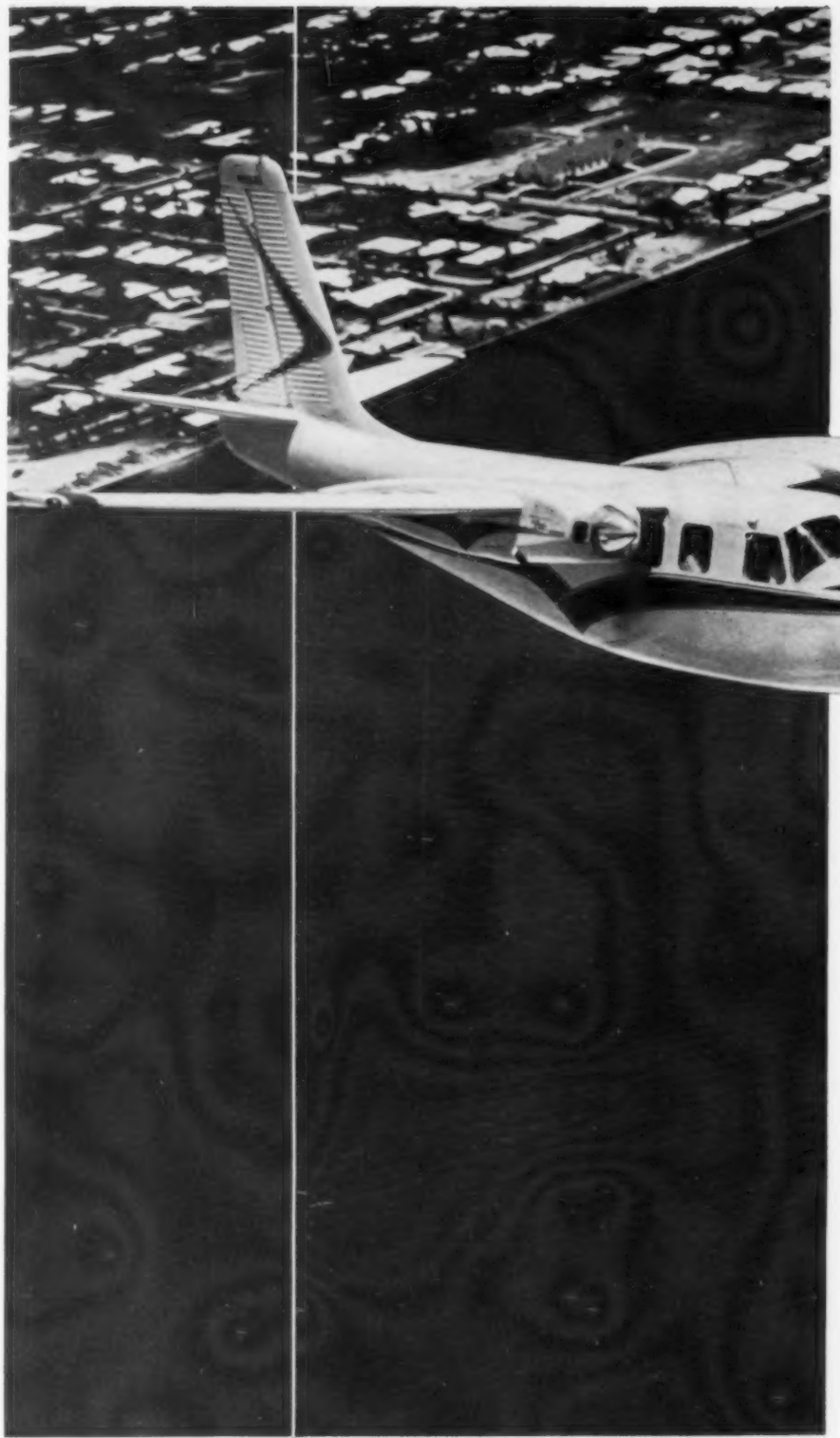
Continental
Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

FIRST DELIVERY OF SIKORSKY S-62 turbocopter has gone to Petroleum Helicopters of Lafayette, La., largest fleet operator of copters in the U. S. Stanley Clay, chief pilot for Petroleum Helicopters, is shown taking delivery from Sikorsky Sales Manager Jim Clyne. The S-62 is powered by a GE T58-6 shaft turbine derated to 730 shp.

aircraft to include two single-engine planes smaller than the Bonanza-Debonair and a turbo-prop, pressurized executive transport larger than the Beech Super 18.

TWO NEW FUEL-INJECTED LYCOMING ENGINES have been FAA certificated — the supercharged and geared IGSO-540 and the IO-540. With continuous-flow fuel injection at the supercharger inlet elbow, the IGSO-540 has a take-off rating of 380 hp. at 3,400 rpm. at sea level up to 12,000-ft. altitude, normal rating of

DIVISION STATUS FOR MARKETING has been established by Cessna Aircraft Co., with Frank Martin (below) as marketing division manager. Martin became commercial aircraft sales manager in 1954 and since then Cessna's commercial aircraft sales have increased over 8 times from $5.4 million to a record $46.6 million for 1959.



EXPERIENCE

EARNED FOR DOWNTOWN AIRPARK THE REPUTATION OF

PAINT HEADQUARTERS FOR AIRPLANES

MAY WE GIVE YOU THE NAMES OF COMPANIES AND INDIVIDUALS IN YOUR NEIGHBORHOOD WHO HAVE EXPERIENCED COMPLETE SATISFACTION WITH OUR . . .

- *PAINT DESIGNS*
- *NEW PAINT JOBS*
- *REFRESHER COATS*
- *SAFE-T-GLO TRIM*
- *PROMPT DEPENDABLE SERVICE*
- *ECONOMICAL PRICES*

ANY MAKE OR MODEL

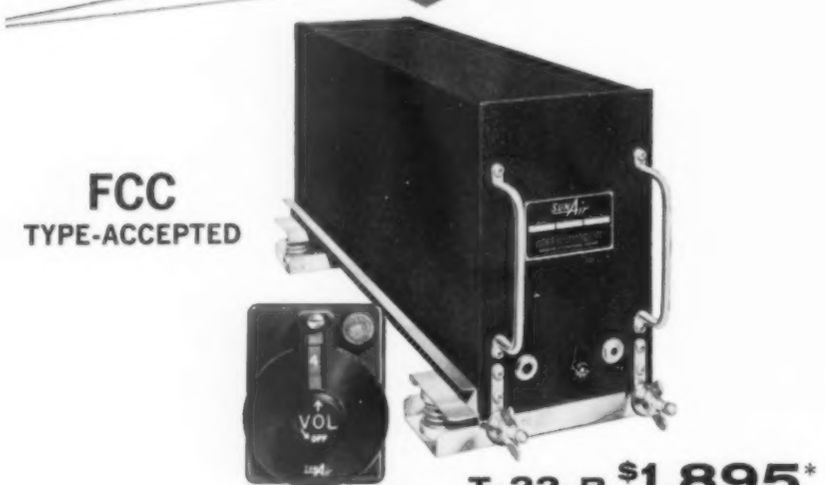
SO CONVENIENT . . . to have our complete overhaul and repair shops take care of your other needs while your airplane is in for a new paint job. Here a seasoned staff of A & E mechanics, working in modern, well-equipped shops and backed by a large, well-stocked parts department, will hold "down-time" on your airplanes to a minimum.

phone MElrose 4-1456 *before you buy*

DOWNTOWN *Airpark* INCORPORATED

1701 S. WESTERN • OKLAHOMA CITY, OKLAHOMA

YOU'RE NEVER OUT OF RANGE WITH THIS NEW SUNAIR HIGH FREQUENCY TRANSCEIVER



FCC TYPE-ACCEPTED

T-22-R $1,895*

The very finest in truly long-range aircraft communications — 2500 miles and more is not uncommon. FCC type-accepted for aviation and marine use makes possible the added advantage of plane-to-boat and plane-to-land telephone communications. Pound-for-pound, power-for-power, the most sensible investment in high-frequency radios for light, medium or heavy aircraft.

- 22 transmit-receive channels
- Famous SUNAIR built-in transistor power supply
- Less than 15 pounds
- Standard ½ ATR rack
- 14 or 28 volts

*Subject to change and FOB Ft. Lauderdale, Fla., U.S.A.

Available from SunAir Dealers throughout the world. Write for name of dealer nearest you.

For top performance in a 5 channel HF transceiver, ask your dealer about the SUNAIR T-5-D and T-5-R.

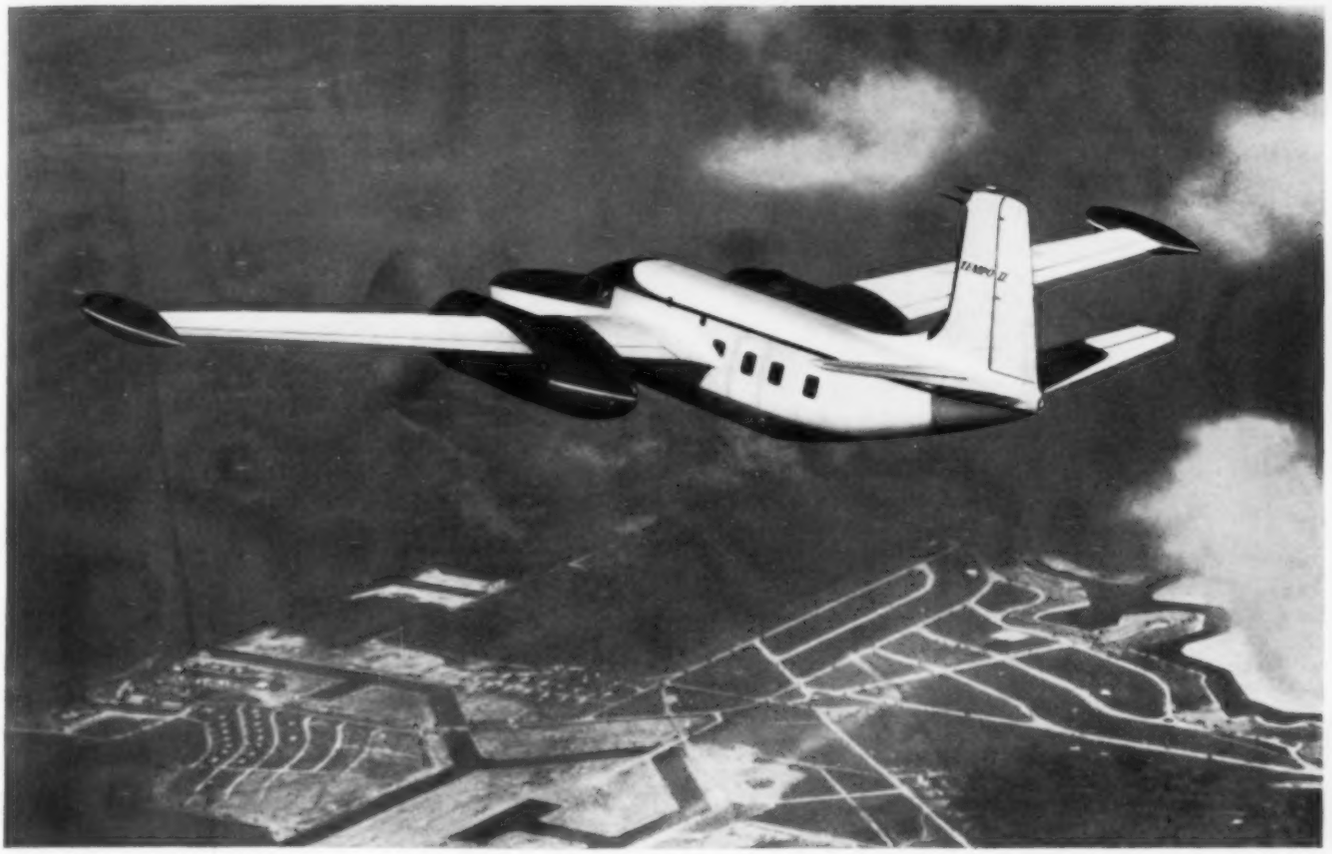
SUNAIR ELECTRONICS, INC.
BROWARD COUNTY INTERNATIONAL AIRPORT
FORT LAUDERDALE, FLORIDA, U.S.A.
CABLE ADDRESS: SUNAIR

Known and trusted around the world

NEW FOUR-PLACE HILLER E4 helicopter and its 3-place counterpart, the 12E, are shown above after Hiller Aircraft unveiled the new $69,960 4-place copter recently. The Hiller E4 has a 305-hp. Lycoming VO-540 engine, 990-lb. useful load at 2,750-lb. gross weight, 1,340-fpm. maximum rate of climb, 9,550-ft. hovering ceiling in ground effect, 88-mph. cruising speed and 225-mi. range.
—(Hiller Aircraft Photo.)

360 hp. at 3,200 rpm. up to 11,500-ft. altitude, compression ratio of 7.30 to 1, 532-lb. weight including shielded ignition, spark plugs and accessory drives, and is 20.29 ins. high, 34.52 ins. wide and 48.5 ins. long. First installation is in the new Aero Commander 680F with speed-line nacelles. It is a 6-cylinder engine, as is the IO-540. Both use 100/130-octane fuel. The IO-540 is a direct-drive engine with continuous-flow fuel injection and has a compression ratio of 8.7 to

LING- TEMCO ELECTRONICS, INC., was formed recently by merger combination of Temco Aircraft Corp. and Ling-Altec Electronics of Dallas. Management group below consists of Robert McCulloch (seated right), chairman and chief executive; James J. Ling (seated left), president and executive committee chief; Clyde Skeen (standing right), executive vice president and general manager, and Lee D. Webster (standing left), vice president, secretary and treasurer.



TEMPO II . . . A completely pressurized and air conditioned

aircraft designed for the tempo of modern business

. . . stand-erect and walk-thru, twenty-eight foot cabin

. . . custom designed ten passenger interiors . . .

full compliment buffet, lavatory and wardrobe . . .

a cruising speed of 350 miles per hour

and continental range with the low cost,

proven performance of conventional power . . .

TEMPO II

L. B. SMITH AIRCRAFT CORPORATION

INTERNATIONAL AIRPORT • MIAMI • FLORIDA

NEW CESSNA SALES AND SERVICE CENTER at Van Nuys Airport, California, is this $700,000 facility being constructed by Skyways, Inc., a new dealership under Airflite, Inc., Cessna distributor at Long Beach. Finley C. Brinley, Skyways president, said 14-acre facility will include 20,000-sq. ft. aircraft hangar area and 18,000-sq. ft. office building including 4,000-sq .ft. aircraft show room, complete conference room seating 100 people and having projectors for visual sales aids, and restaurant. T hangars will house 26 single-engine and multi-engine aircraft. Skyways officers, in addiion to Brinley, who is a real estate broker, include Larry Hunt of Air Oasis, vice president, and Walter Von der Ahe, shopping bag firm officer, who is secretary-treasurer.

1. It is rated at 290 hp., its gain of 40 hp. over the 250-hp. carbureated O-540 engine being achieved through an advanced-design tuned induction system coupled with fuel injection. The IO-540 weighs 437 lbs. including starter and generator, is 19.6 ins. high, 34.25 ins. wide and 38.62 ins. long and its first installation is in the new Aero Commander 500B with speed-line nacelles. Fuel injection reduced its height by 6 inches. Fuel consumption is 16.5 gph. at 75% of power and 12 gph. at 60% of power. Still another version of the 540-cu. in. engine will be available soon. It will be the geared IGO-540.

FOUR CONTRACTS FOR TURBINE ENGINES amounting to $20,213,292 have been received by Lycoming from the Air Force for 960-shp. T53-L-5 engines for the new Bell HU-1B Iroquois helicopter and the new 2,200-shp. T55-L-5 turbine which will power the new 3-ton multi-engine Vertol-Boeing Chinook helicopter.

COMMERCIAL BEECH AIRCRAFT SALES for 9 months ended June 30 totalled $36,351,489, up 40% over the same period last year. Total Beech sales, including military, were $78,535,573 for the period, a gain of 22%.

COMMERCIAL CESSNA AIRCRAFT SALES for 9 months ended June 30 totalled $46,791,000, up 25% over the same period last year but sagging military sales were reported and total Cessna volume for the period was up 2% to $84,260,000. . . . Cessna last month received an Air Force contract for 35 additional U-3B all-weather versions of the Cessna 310 twin, its third military U-3 order since 1957. The U-3 averages 59.6 flight hours per month in Air Force

(Continued on page 50)

NEW NAVION FOR 1961 is being kept under wraps until assembly-line production begins in October at Galveston, Texas, by the Navion Aircraft Division of Tusco Corp. William Hopkins (left) heads Tusco and Leo Childs (right) is Navion General manager.

CESSNA

FOR EXTRA SERVICES
LOOK FOR THE
RED AND BLUE
Cessna® PENNANTS

You'll find the Cessna pennants displayed by Cessna dealers across the nation—around the world. Easy to see, easy to remember, Cessna pennants are a symbol of friendliness, hospitality, and expert Cessna maintenance service.

Among the many advantages provided by Cessna dealers, you get:

- Fast, courteous "en route" service
- Modern facilities with comfortable lounges and clean rest rooms
- Lodging and ground-transportation assistance
- Factory-trained personnel for top service
- Factory-approved service equipment
- A stock of genuine Cessna parts
- Prompt time requirements and price quotations for maintenance work
- Itemized invoices

CESSNA'S QUIET NEW SKYLANE—

FULLY EQUIPPED FOR LONG CRUISES

PILOT-PROVED BY PROFESSIONALS

"Here's a ship that has everything built in that I always want to add to other planes. Makes flying fun, all over again. And for long trips, I especially appreciate the extras for easy flying, like the tinted glass and third-window visibility."—Robert W. Stowers, Chief Pilot, Mid-America Eng. Corp., Skokie, Ill.

NOW TRAVEL "STATEROOM CLASS" in the smoothly purring, luxurious new flight\sweep Skylane—without leaving the medium-price range. Complete equipment includes full communication and navigational radio gear . . . gyros and vacuum systems . . . navigation light flasher . . . over-all, 3-color paint . . . wheel speed fairings . . . and many other features, package-priced at just $17,325.*

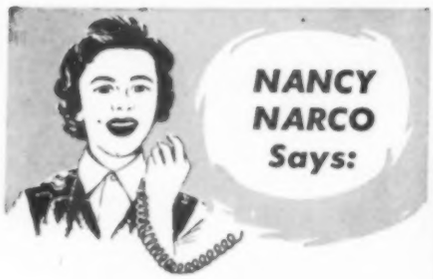
NEW FLIGHT\SWEEP CESSNA 182
The 4-place, all-metal, 230-h.p. Cessna 182 gives you speeds up to 167 m.p.h., with a range of up to 660 miles. For high efficiency you get new flight\sweep design—boosts power, performance, and economy. For easier flying, you get huge Para-Lift flaps, High-Stability Wing, and Land-O-Matic. And for your flight enjoyment, you get a big comfort-engineered cabin. Price: $14,890.*

FOR DEMONSTRATION RIDES, call your Cessna dealer now. (See Yellow Pages.) Look at all 9 great new models . . . starting at $7,250.* *Also ask your dealer about finance and lease plans.*

Or write: Cessna Aircraft Co., Dept. FM-8, Wichita, Kansas. For extra services, look for the red and blue Cessna pennants.

*With std. equip., f.o.f. Wichita.

9 FLIGHT\SWEEP CESSNA AIRPLANES—ONE FOR EVERY BUSINESS NEED



CHATTER CLUTTER

There are a number of ways each of us can cooperate in reducing the amount of unnecessary radio traffic on routine radio call-ups to FAA Flight Service Stations and airport towers. While some of these systems may not be recommended as "official", they have become generally adopted by the "pros" and are apparently well accepted, understood and appreciated by the controllers on the ground.

Considerable time can be saved and much repetition avoided on the initial call-up to a tower. Usual procedure is to call "XYZ" tower, this is "Speedwing One Two Three Four Alpha", then wait for acknowledgment, then give your position, then get instructions.

You'll save everyone's time if you'll give your position or distance from the airport on first call-up, such as "XYZ Tower, this is Speedwing One Two Three Four Alpha, Ten West, for landing." With such an introduction the tower's ready to give you instructions immediately. It involves two transmissions instead of four.

You can really save time and congestion if you listen in to the tower well before you make your first call-up so that you already have all pertinent landing information — such as runway, wind, altimeter setting. Then you can say "XYZ Tower, this is Speedwing One Two Three Four Alpha, Ten West, I have your numbers." That reduces the tower's acknowledgment to "Roger Three Four Alpha, cleared to enter traffic, call down wind."

Note, we use the example "Speedwing One Two Three Four Alpha" rather than "Nan One Two etc." It is extremely helpful, if not essential, for controllers to know the exact type of airplane you are so they can have a better picture of your speed. "Nan So-and-so" or "Piper So-and-so" or "Cessna So-and-so" means very little. You can be a Cub or a 310, a 172 or an Aztec and if you identify yourself as just plane "Nan" you might be a Jetstar or a PT-17, as far as the controllers know. That makes them ask back "What type aircraft are you?", with further additional chatter.

And, although this would be officially denied, you somehow get expedited treatment when your transmissions indicate you're on top of the situation. You're much more likely to be given a straight-in approach or a right turn in if that would expedite your landing.

Regards,

Nancy

NARCO • Fort Washington, Pa.

P.S. If you'd like a FREE "sticky-back" placard for your instrument panel listing all basic frequencies, just drop me a line. Please be sure to include your return address. —Nancy

NARCO SCORES AGAIN!

with a

190-CHANNEL CRYSTAL-CONTROLLED
VOR/ILS LOCALIZER INDICATOR
VHF COMMUNICATIONS RECEIVER

NEW *narco* MARK VI

Here's the answer to the need for an independent VOR/ILS localizer receiver/indicator—the Narco Mark VI. Gives you the convenience of fast, positive crystal-controlled tuning to all NAV/COMM frequencies between 108 and 126.9 megacycles. Lets you add a second Omni with minimum space and cost, without tying up your communications radio.

Weighs just 6½ pounds and requires only 3" by 6¼" panel space; completely self-contained, no separate power supply needed. Same size as the popular Narco Mark V, same fine crystal-tuning feature, exceptional accuracy, completely dependable for IFR operations.

MAKES POSSIBLE THE "ULTIMATE IFR SYSTEM" FOR LIGHT TWINS AND SINGLE-ENGINE AIRPLANES AT PRACTICAL COST

The Mark VI with two Narco Mark V's—one with Omni attached—gives you a complete "2½ System" for complete navigation and communications service.

- **Mark VI** for primary navigation always available for VOR or ILS.
- **Mark V** with VOR/ILS attachment—provides second Omni plus all-channel crystal-controlled communications.
- **Mark V** for primary all-channel communications always available for direct Center, Approach Control or Tower communications.

OR BUILD UP YOUR SYSTEM

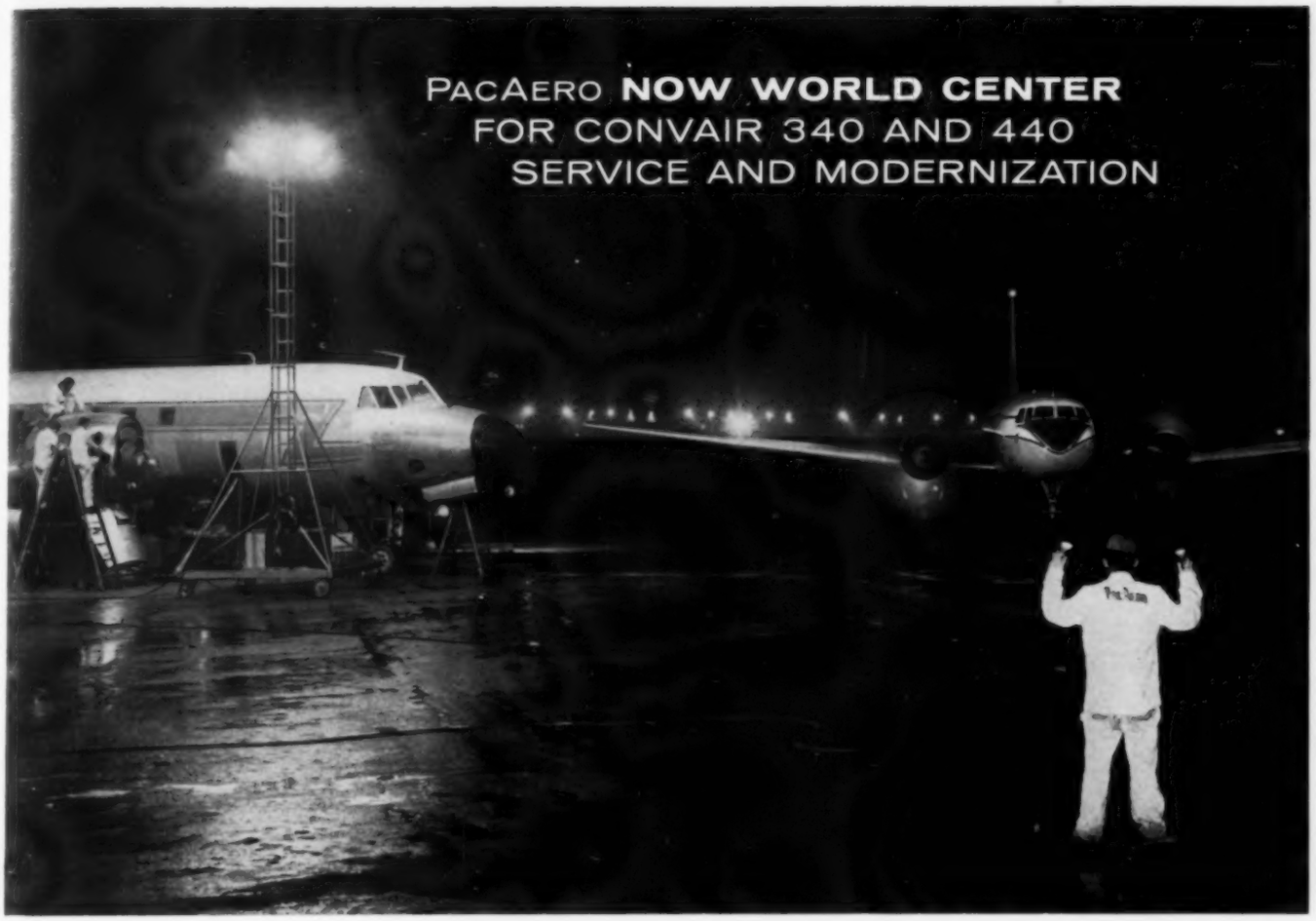
Replace your older, limited-channel, tunable-receiver NAV/COMM equipment with a Mark VI for VOR/ILS navigation and a Mark V for all-channel communications. Add other equipment later.

narco

See your Narco distributor or write for new Mark VI brochure

narco

NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.



From 100-hour check – to major overhaul – through Allison Prop-Jet conversion – PacAero has the men and means for the finest Convair service – around the clock

Convair operators the world over rely on PacAero for any and all of their service and modernization requirements, because PacAero – with the direct cooperation of Convair – has amassed more Convair conversion experience than any other firm, along with Convair-qualified personnel and specialized facilities. All PacAero materials and workmanship are warranted and certified. Result: PacAero assures your Convair the ultimate in service and modernization at minimums in cost and down-time.

PacAero is the exclusive source for Convair 340 and 440 conversions to quieter and more efficient Allison 501-D13 prop-jet power, as sub-contractor to Allison Division of General Motors. This conversion boosts cruise speed by 80 mph, involves modifications of the aircraft's nacelle, systems, heating, air conditioning, controls, empennage and other areas.

Other PacAero services to Convair operators include: service and overhaul; design and installation of custom interiors; installation of radar, navigation, communications and specialized electronic equipment; fuel expansion; and exterior painting.

For around-the-clock Convair service, modification, or conversion, come to PacAero for the fastest and finest!

PACAERO ENGINEERING CORP.

A subsidiary of Pacific Airmotive Corporation, Burbank, California

3021 AIRPORT AVENUE, SANTA MONICA, CALIFORNIA • EXmont 1-5281

Other PacAero Specialties: On all multi-engine aircraft – design and installation of custom interiors; installation of radar, navigation, communications and electronic equipment; fuel system expansion; airframe overhaul and painting. Also, Lodestar modification to JATO boost; Learstar manufacture; Alternate fuel metering systems; Spraymat anti-icing, de-icing systems.

FIRST IN THE JET AGE!

Propellers keep us flying in the Jet Age while the wizards go about developing propless rigs for our bosses' use tomorrow. So, jet-powered Southwest Airmotive continues fine propeller craftsmanship for airplane owners throughout the Western Hemisphere.

I'm pointing to the 10,000th prop overhauled at Southwest Airmotive since World War II.

This is a mirror-finished 33D50 for an eastern oil firm's Lodestar. Others turned out by the shop range from puddle-jumper size to the big Hamilton Standard props for Convairs and DC-6s.

They're ready, willing, and able to do 10,000 more!

Southwest Airmotive Co., Dallas

1st with Jets

AIRPLANES • ENGINES • SERVICE • SUPPLY

Parts Outlets: Denver, Houston, Kansas City, St. Louis

Just among ourselves

Our Disappearing Airports

MR. Edgar Queeny, Monsanto Chemical chairman, tells the story of a disgruntled citizen and taxpayer of St. Louis who, in 1928, tried to restrain the city from issuing $2 million in bonds which had been voted for the purpose of buying Lambert Field.

The irate citizen stated in his petition that "it will afford a starting and landing place for a few wealthy, ultra-reckless persons who own planes and who are engaged in private pleasure flying . . . the number of persons using the airport will be about equal to the total number of persons who engage in big-game hunting trips to the African wilderness and voyages of North Pole exploration."

Later on, the petition states: "In the very nature of things, the vast majority of the inhabitants of the city cannot now and never can reap any benefit from the existence of an airport. True, it may be permitted to the ordinary, common garden-variety of citizen to enter the airport free of charge, so that he may press his face against some restricting barrier and sunburn his throat gazing at his more fortunate compatriots as they sportingly navigate the empyrean blue. But beyond that, beyond the right to hungrily look on, the ordinary citizen will get no benefit from the taxes he is forced to pay."

This resident's litigation effort failed and today some two-and-one-half million people fly in and out of Lambert Field annually. Presumably not all will be ultra-reckless millionaires, or will the hoi-poloi be sunburning their throats watching the airplanes come and go from one of the finest airport terminal buildings in the country.

Unfortunately there are still many of our citizens who are as much "agin" airports and airport development as the disgruntled citizen of St. Louis. They have modernized their methods of attack but in many cases they are quite effective in defeating bond issues and otherwise blocking airport progress. Somehow they have failed to learn that even though they do not fly or patronize the many services afforded by air transport, the airport is as integral to the economic life of a community as any other public service, utility, highway or surface transportation system.

At the present moderate growth of air transportation we will reach the airport saturation point much sooner than the experts predicted ten years ago. We are running out of ground facilities in many areas — airports, runways, hangars, fueling and servicing facilities. There are still many areas in which there are no airplanes or services at all simply because there are no airports. There are still others where airports once existed and are now gone. We are not even keeping abreast of airport attrition, let alone taking care of the future.

Simply stated, we are creating for the airplane the same mess we created in our towns and cities for the automobile. While various agencies and organizations, including private companies and individuals, from time to time attempt to attack the problem of more and better airports, either nationally or locally, there is no concerted effort for a truly national airport program. We just nibble around the edges of the problem and mostly blow off steam.

It might as well be recognized that the airport problem is too large and far too complex for any one segment of the industry or for any one organization to handle alone. If we had an "aviation chamber of commerce" on a national scale to spearhead and coordinate a national airport development program we might get somewhere. Lacking such an organization we can only look forward to the present system of isolated efforts and the puny results of such efforts. Those who expect the Federal government to take the initiative as was the case in years gone by are behind the times. That era ended five years ago. Today the development of airports is strictly a local, state and industry matter. Outside of the preparation of a few terminal fields for the jets, the domestic airport situation looks mighty bleak for the future.

A Point-Four Plan For Civil Aviation

THERE are all kinds of U. S. citizens touring the Soviet Union these days and many of them come home as ignorant as they were before the Russian Intourist Agency got hold of them for the personally escorted propaganda tours most everybody has to take to see anything. Many are impressed with "progress" they find there, especially in the larger cities that give the appearance of prosperity, what with all the new apartment building going on and the streets and stores filled with product-hungry shoppers.

During our own visit to that drab and depressing country we learned, all Soviet propaganda to the contrary, they are so far behind the West in so many ways it is doubtful that they will ever catch up in spite of their cynical dictatorship that can make split-second decisions and go all out on any project they desire, as they did in the case of Sputnik.

We were especially impressed with how far our country is ahead of them in the field of utilitarian aviation. It appeared as though they were about at the point we were during the depression years of the 1930's. Outside of "sporting" aviation, which was limited entirely to sovietized flying clubs, and an obvious emphasis on helicopters for workhorse projects, we saw very little evidence of any progress in the lightplane field. Even in these two areas one can discern the shadow of war preparation. They have absolutely nothing to compare with the extensive civil aviation resources in the United States.

We believe it's practically impossible for the Soviet Union to compete with us on a civil aviation front. In other words, if we were to transplant some of our agricultural and industrial aviation resources into backward and undeveloped nations we would have an effective and visible means of assist-

ance to needy nations and enter a field that would be difficult for the Russians to copy. Our rich civil aviation resources were built up over a period of many years under the stimulus of free, competitive enterprise. Our manpower in this field of aviation endeavor is expert and professional, seasoned by experience. The only additional knowledge our people might need to go abroad and establish civil air operations would be language study and perhaps an indoctrination course.

The billions we have spent on foreign aid since World War II have not generally sifted down to the level of the average citizen except in Western Europe, where everybody has felt the impact and recognizes we saved them from Communism. But in the far reaches of the Orient, the Near East, Africa and Latin America our investments in foreign aid have left much to be desired in the matters of making friends and influencing people. The Communists have outsmarted us all over the globe by their grandstand plays using simple, direct methods of aid which are exploited by expert propagandists to make each individual feel he is getting help from "Mother" Russia.

By transplanting some of our agricultural and industrial aviation facilities into backward areas we would provide a vehicle that can be seen and understood by all the people. By increasing food production through modern aerial application methods developed in this country we would have a visible, tangible symbol of U. S. assistance which would not only put more food in the undernourished bellies but be of propaganda value on the scale the Russians have so effectively utilized to build themselves up and simultaneously paint us as villians. Too often our implements of foreign aid have been unromantic and unpublicized projects of vital importance to the welfare and economy of the nation involved but far removed from the natives' daily life. Our civil aviation resources would give them something they could see, feel or eat. The people of the ox-cart nations are not interested in jet service to New York.

We could easily afford to send cadres of aviation specialists into many lands with adequate equipment to create an effective aviation "Point-Four" program. A desirable by-product would be the training of natives in this priceless and useful art and science that is typically American. The relative cost of such projects wouldn't be a drop in the bucket compared to the over-all foreign aid budget and need not steal funds away from major projects already decided upon. A certain amount of self-interest would be involved because American airplanes and helicopters would be the standard equipment used and firmly rooted.

This nation has had an excellent training program for many years for foreign nationals in aviation but the emphasis has been on the military aspects. We submit that the time has come to include civil aviation as an integral element of our foreign aid program without delay, not only on the basis of what this peculiarly American product can accomplish for the betterment of peoples in the underdeveloped regions, but also on the basis of national self-interest.

Madman Fidel Castro is hopping about Cuba in a Russian helicopter, a gift from the Kremlin to their latest stooge. This is only the beginning of the Russian infiltration of this hemisphere. It should be a loud and impressive warning that time is running out. The simplest method of infiltration is through aviation and apparently the Russians are just now discovering the fact. We have the lead time at the moment, the productive capacity, the designs and the manpower.

Is it not strange that here is one of the few exclusively American capabilities that hasn't been matched anywhere and that it is the one major asset we have neglected to export as a part of the aid program? After all, the utility airplane has proved beyond any business doubt that it is fully capable of justifying its operation through workaday efficiency in small and large business, industry, agriculture and government agency operations. It can do the same as a valuable tool for work wherever the need for efficiency is recognized.

NATA Survey Reports 1,870 Aerial Applicators Use 6,000 Planes to Treat 86 Million Acres Yearly

APPROXIMATELY 1,870 aerial applicators in the U. S. operated nearly 6,000 agricultural airplanes in 1958, averaging 3.24 aircraft each, and flew them between 250 and 300 hours annually per aircraft in covering 86,000,000 acres in spraying, dusting, fertilizing, seeding and other aerial application work. Piper airplanes were predominant, with 450-hp. Stearman biplanes a close second.

These facts were reported last month by the National Aviation Trades Association, which conducted a survey of ag operators early in 1959. Lloyd Nolan, NATA vice president-application, was in charge of the survey and analytical work was performed under contract by Dr. Kenneth Razak, dean of engineering, University of Wichita. Robert E. Monroe, executive director of NATA, reported the survey. He said it produced returns from about 1 out of each 12 operators. The sample obtained is not large enough to produce strong statistics but does provide general impressions and approximate levels of activity. The NATA survey was summarized to include the following:

Returns were from 35 states, with over half of the operators conducting their operations in their home state. Of those operating in more than one state, the majority restricted their range to 2 or 3 states. Those staying within their state operate in a radius of only 30 to 60 miles and several of these grossed $100,000-$150,000 in 1958 in their local areas. Average working season was 5.27 months per year.

Aerial applicators covered a total of 86 million acres of crops, the average coverage being 46,600 acres. Total gross revenue for 1958 was $147 million and total profit was estimated at $19.4 million. NATA believes this included the individual operator's salary in most cases. The industry's total assets were estimated at $110 million, with a net worth of $96 million, indicating very little borrowing. The average agricultural aviation operator grossed $80,000 and netted $10,500.

Agricultural aircraft in operation totaled about 6,000, averaging 3.24 airplanes per operator. Average number of hours operated per year was 250-300 hours per airplane. Although the reporting sample was not considered representative of each of the aircraft types in use, the largest number of agricultural aircraft were Pipers with the 450-hp. Stearman a close second. Third in popularity was the 225-hp. Stearman. Variety included Aeroncas, Callairs, Stinsons, TBM's, DC-3's and PBY amphibs. Average time between overhaul for engines was 750 hrs. for the R-985, other engines averaging between 600-800 hrs. between overhauls. This is only slightly less than ordinary flying, indicating the ag operators take good care of their engines.

A great variety of crops are treated by aerial applicators. Ranked by percentage of operators working them, crops listed were wheat 61%, corn 46%, barley 44%, oats 39%, cotton and alfalfa 31% each, all vegetables 25%, range land and grass 16%, soybeans 12%, rice, potatoes and sugar beets 11%, peas and fruit trees 9% and timber 5%.

Most of the operators — 84% — fly themselves. Aerial applicators spend 60% of their time in actual application, 15% in ferrying between loads, 15% in going to and from the job and 10% in loading. Sixty-seven per cent do not use radios in aircraft or at base — only 16% use radios in aircraft. Fifty per cent of the operators have a high school education and 35% have a college education or part of it. Over 80% indicated agricultural aviation was 100% of their business.

Sequoyah Park Air Strip
OCTOBER 6-9
all pilots are welcome
NPA
NATIONAL
PILOTS
ASSOCIATION
WESTERN HILLS LODGE
WAGONER, OKLAHOMA
Fly-in of the year!
BRING THE FAMILY
Wives, children, and non-pilot friends will find a wonderful variety of activities at Western Hills Lodge: swimming, fishing, golf, hunting, riding, archery, dancing, stagecoachrides. Special activities for children, teens. Also nursery care.
PROBLEMS WITH THE FEDERAL AVIATION AGENCY
Federal Aviation Agency relations with general aviation pilots will be discussed in detail. Sat., Oct. 8, NPA members draw up the Association's policy on this subject. Dinner speaker that night: Sen. "Mike" Monroney on "Should Changes Be Made In The Federal Aviation Act"?
OPTIONAL PROFICIENCY COURSES
Tulsair School of Aviation will offer special flight courses to pilots attending the Fly-In Weekend. Courses offered will include: instrument ground school, basic instrument flight training, seaplane rating, and night flying, given at the Western Hills Lodge.
VFR AND IFR PILOT "SKULL SESSIONS"
General aviation's best informed people will round-table in-flight problems at separate VFR and IFR sessions . . .
VFR subjects: "Flying Into High Density Airports", "Getting and Using Weather Information", "Omni-Navigation".
IFR subjects: "Practical IFR In Single Engine Aircraft", "Avoiding Thunderstorms With Ground Radar Information", "ARTC Procedures", etc.
IF YOU WANT MORE INFORMATION...
about hotel accommodations, recreation facilities, etc., write directly to Western Hills Lodge, Sequoyah State Park, Wagoner, Oklahoma. For more information about the Fly-In or the National Pilots Association write NPA Headquarters: 1025 Connecticut Ave. N.W., Wash. D.C.

ATTEND, YOU DON'T HAVE TO BE AN NPA MEMBER

Here's the number one get-together of the year for *all* general aviation pilots. Popular models of aircraft will be displayed and available for demonstration at Sequoyah Park Air-Strip by the Lodge. Displays by manufacturers of radio, autopilot and other equipment also.

DON'T MISS THIS GREAT FLY-IN WEEKEND PROGRAM

Thursday, October 6th Fly-In and registration. Flight demonstrations at Airstrip by aircraft and equipment manufacturers. Equipment display booths open . . . equipment briefing sessions at the Lodge. Advance registration is required for optional proficiency courses which begin at noon Thur. and continue to noon on Sun.

Friday, October 7th Morning and afternoon VFR and IFR "Skull Sessions". Flight demonstrations and proficiency courses continue. Informal dinner . . . FAA discussed.

Saturday, October 8th "Skull Sessions" and flight demonstrations continue. NPA business meeting after lunch. Dinner speaker Sen. Monroney. Pilot of the Year Award.

Sunday, October 9th Informal Fly-Away Breakfast. Flight Demonstrations. Wind-up of proficiency courses.

ADVANCE RESERVATIONS REQUIRED

MAIL TO: Rm. Clerk, Western Hills Lodge, Sequoyah State Park, Wagoner, Oklahoma

On a separate sheet please give your name, address, city, arrival time (am or pm), departure date, the number in your party, and the name of each person and whether or not they are NPA members. Please advise if you want to take one of the optional flight courses.
NOTE: If you wish to reserve more than one of any accommodation specify at left of the accommodation.

CIRCLE Accommodations Desired. Check (X) 2nd Choice.

Rates are for the room, whether it is occupied by one or two persons. Each room can take one rollaway or crib, increasing capacity to three persons. There is an extra charge of $2 ($1.25 under 14 years). Cribs are provided free.

Lodge, Double Bedroom	$14.00
Lodge, Twin Bedroom	$15.00
Studio Rooms	$17.50
Guest Houses, Doubles	$12.50
Guest Houses, Twins	$14.00
Suites	$25.00-$40.00

Enclose deposit equal to one day room rate

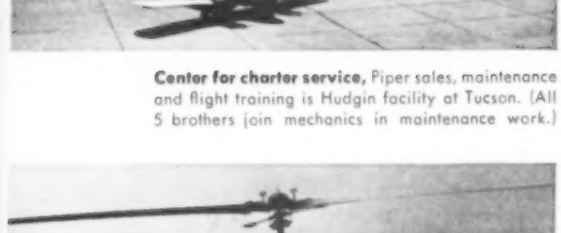
GRAND CANYON EAGLES

A behind-scenes report on Arizona's flying Hudgin brothers—owners of Grand Canyon Airlines, Grand Canyon Airport, Hudgin Air Service and Hudgin Aero-Tech

by HERB FISHER
international aviation authority, veteran test pilot, author

On helic
watch oth

Center for charter service, Piper sales, maintenance and flight training is Hudgin facility at Tucson. (All 5 brothers join mechanics in maintenance work.)



At Hudgin-owned Grand Canyon Airport, brothers Palen, Louis, Henry and Walter witness shakedown flight of their new 47G-3 Bell. Al is at controls.

Inspecting Champion-fired Lycoming engine at Hudgin Air Service maintenance facility in Tucson are (l/r) Henry, Palen and Louis Hudgin.

The five Hudgin brothers were born in a dusty little cow-town on the Mexican border. They spoke Spanish as fluently as English, were as familiar with Apache customs as they were the three R's, and shared a common conviction regarding the nearby Santa Rita Mountains—that one day all five would soar like the great bald eagle above those lofty peaks.

Of the brothers, Al Hudgin was the edgiest to get up there with the eagles. In 1928, he rented an old Curtis N-9, taught himself to fly it. During the next four years, he flew everything he could get his hands on—in fact, 150 different models! In the eyes of Nogales, Ariz., townsfolk, Al was a hero. But in the eyes of Mexico and Arizona lawmen, Al's eagle antics verged on villainy. Landing on main streets to gas up, for example, scares horses and makes a shambles of siestas. Mexican police ordered Al to keep his flyin' jenny north of the border. North of the border, Tucson police threw him in jail for landing alongside a sorority house where flapper-era coeds were sunbathing . . .

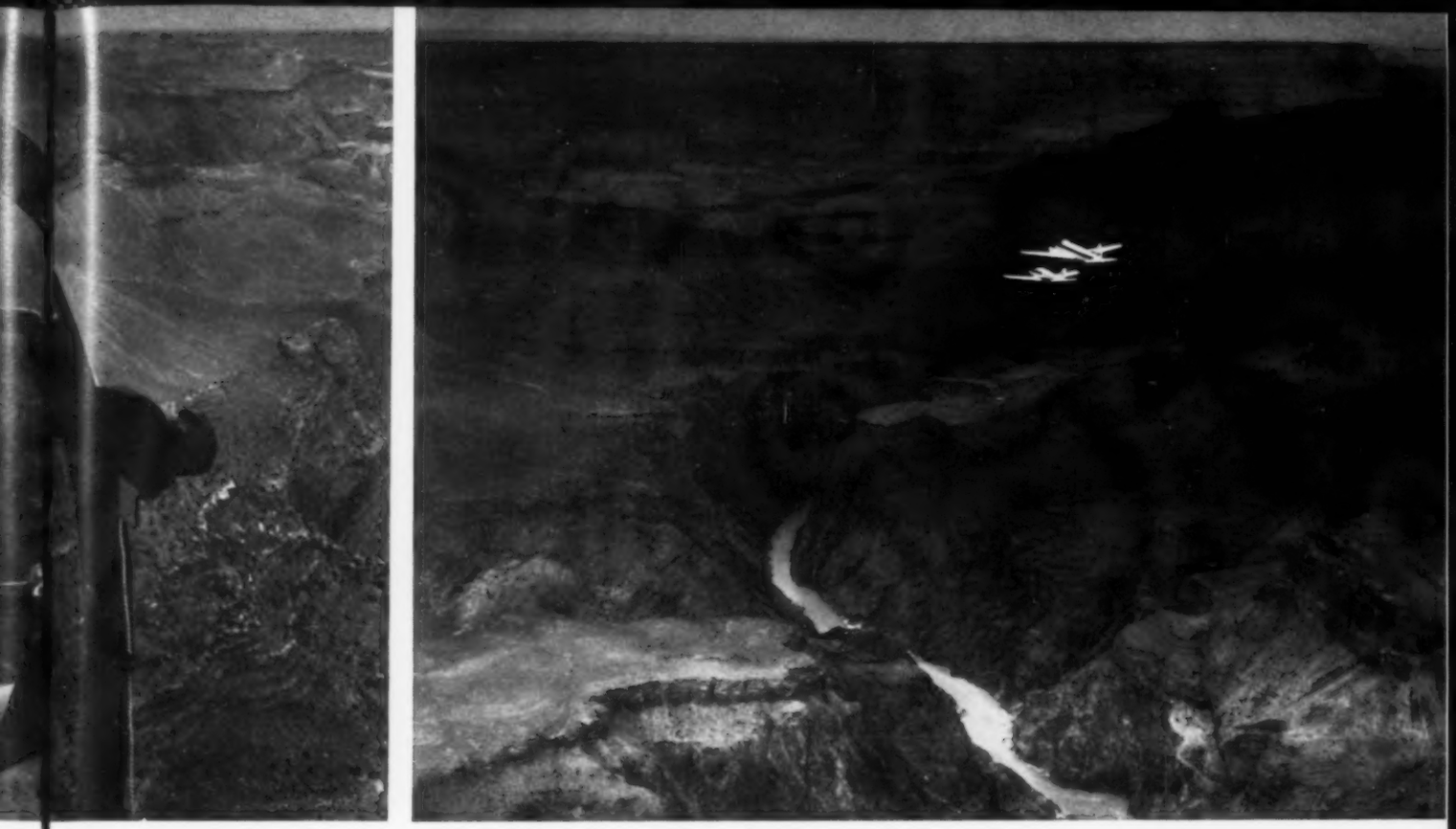
Al was convinced the art of eagles should, indeed, be put to more beneficial use. He offered his services to Mexican revolutionary forces. The rebels told him they didn't need a one-man air force. Okay, he'd make it a five-man air force. Al taught older brothers Louis and Walter to fly. When kid brothers Henry and Palen were 12 years old, Al taught them to fly.

Meanwhile, however, Al began to think he'd rather make money with his flying than fight wars. (Later, during World War II, Al was Chief of Flight for the Tucson Division of Consolidated Vultee—authorized to fly anything the Air Force had.) Who had money in the early 30's? Texans. Al opened a flight school in Del Rio. But trying to interest Texans in making like eagles proved hopeless. The next year, Al returned to Nogales and started a flight school there.

In 1938—unable to pay grocery bills, let alone installments on his plane—Al scraped up $22, roared off over the Santa Ritas, set down on a dirt airstrip outside Tucson and planted his flight school shingle there. He worked hard. At the end of six months he was purchasing a second plane and was inviting a brother to join in the fun . . .

Today, the easy-going, fun-loving (but serious-minded when it comes to flying) Hudgin brothers are an institution in the Grand Canyon State. They've built a unique, family aviation empire—no subsidies, just "guts and gall."

All five (Al's president) own and operate the 987-acre *Grand Canyon Airport* and internationally famed *Grand Canyon Airlines*, a tourist service devoted to awesome sight-seeing flights down into "the grandest of the Seven Wonders of the World." With its 10,000-ft. runway, Grand Canyon Airport is the longest privately owned and maintained airstrip in the world. The Hudgins have their own refueling trucks, a road grader for maintaining 2½ miles of private highway, a Diesel-generator powerplant, their own 11-mile telephone



On helicopter tourist flight through Grand Canyon, Al Hudgin hovers so passengers can watch other sight-seers fly 3,000 feet down into the Canyon via Comanche and Dove. "If you *know* the Canyon and have dependable equipment, you're as safe as you are in your own backyard," Al says. His 10-year record running Grand Canyon Airlines confirms it.

system, water system, and other standard airport facilities.

In Tucson, Al himself owns (his brothers help him operate) *Hudgin Air Service*, an all-purpose charter operation and Piper Aircraft sales/service center for Southern Arizona and Sonora, Mexico. With several hangars, H.A.S. does general servicing (including complete engine overhaul) on outside aircraft as well as on its own. H.A.S. sells 20 to 25 planes a year, led in statewide Piper sales last year. Charles Jenkins is Head of Maintenance; pilot-mechanic Dean Terry flies charter.

The brothers also own (Al is president) *Hudgin Aero-Tech, Inc.*, their flight school at Tucson. It's approved for instrument-through-commercial ratings. V. L. "Casey" Jones, an old friend of mine and another "aviation legend" in the Southwest, is Flight School Director.

The combined Hudgin operation—Piper Tri-Pacers, Apaches, Comanches, Super-Cubs, a DeHavilland Dove and new 47G-3 Bell helicopter—flies 4,000 hours a year under Arizona's drastically varying operating conditions. *The Hudgin brothers' safety record remains unblemished.*

Al had this to say about it: "Herb, if you know the Grand Canyon, you're as safe as you are in your own backyard and can go nearly any place an eagle can in it. We fly tourists, safely, as much as 3,000 feet *below* the North Rim! But if you don't know the Canyon—well, don't ever try flying in it 'cause it can be sheer hell. There's no way of judging size and distance of things, for example—those buttes are really deceiving!

"Then there's another factor *most vital* to flying the Grand Canyon—*or any place in this mountain-and-desert state*, for that matter: Your *engine* has to be as *dependable* as you can possibly make it—almost to the point of perfection, in fact. That's why you're here, Herb—'cause you heard we wouldn't send our planes up without Champion spark plugs in them . . . *and you heard right!*"

Most spectacular of Hudgin Air Service missions are those you seldom hear about. A few recent examples: Towing, at the end of a cable, a radioactive "item" from "somewhere in the east" to "somewhere in the west" — tricky business. Flying *hundreds of times* through *every* smelter plume in Arizona—altitude, 50 feet—to check smoke content. Taking ice crystals from clouds at 22,000 feet—in an Apache—for the University of Chicago. Taking air samples at 18,000 feet—Tri-Pacer and Super-Cub—for the University of Arizona's Atmospheric Research Department. Counting "dust-devils" (desert whirlwinds). Towing gliders. Flying sportsmen or mining engineers to remote spots throughout Mexico. Putting smoke-jumpers or supplies in at forest fires raging along sometimes almost inaccessible heights or canyons. (*The Hudgin brothers pioneered fire-drop techniques now used in the Southwest.*) Patrolling powerlines via Cub or Tri-Pacer. Surveying in Navajo Land, a 22,000-square-mile wasteland meaning death to the careless. Uranium prospecting in hazardous places like the Painted Desert or Monument Valley. Cloud seeding. Flying an air-ambulance, on immediate call, any place in North or South America. Air-taxiing businessmen any place, any time. Linking remote ranches or mines with the airlines.

"The most hazardous flying," says Palen Hudgin, "is coming in at those forest fires for a supply-drop at 50 feet. Air currents are terrific—and sometimes the pine trees are sticking up there higher'n you are. That's where fouled spark plugs could hang you on a limb."

The Hudgin brothers use Champion's new REM40E *Foul-Resistant* plugs in their aircraft. With their Tucson airstrip at 2,550 feet altitude and their North Rim airstrip at 8,550 feet—and with all the ups and downs in wind, sand and sun in between—plug-fouling could be a major drawback.

"We operate in wicked extremes of temperature, elevation and elements like fine abrasive sand," Al said, "and, like I told you, our charter planes have some *long* hauls over Mexico and the U. S. But with anti-fouling REM40E's, our engines are completely *dependable*—no plug fouling! The two-prong electrode, longer core nose and bigger bore of the REM40E let combustion gases blast the firing-end *clean!* You don't have lengthy burn-out or last-minute plug changes, either. We pull these at 400 hours—and Herb, they're still good!

"The only problem we have is one Champion can't do anything about—that's the big buck antelope that get curious and chase our planes around the Grand Canyon Airport on occasion . . ."

CHAMPION SPARK PLUG COMPANY
TOLEDO 1, OHIO

(Advertisement)

New Dove has 400-hp. supercharged and fuel-injected engines, higher cockpit canopy for more room, custom Horton & Horton interior including heated water, lavatory and toilet and 264-gal. fuel capacity for 1,140-mile range at 210 mph. or 1,412-mile range at 182 mph. with 45-min. reserve. —(FLIGHT MAGAZINE Photo.)

New Custom 800 de Havilland Dove

A NEW and improved version of the world-famous British-built de Havilland Dove is now being marketed, featuring increased power and performance. The basic new series is designated as the Dove 8, with a Custom 800 version especially outfitted for business flying sales in the United States.

With 400-hp. engines, increased cockpit headroom, a luxurious custom interior and completely equipped with everything except radio, the twin-engine, 8-place Custom 800 is priced at $129,850. This includes as standard equipment numerous features formerly available only as optional equipment at extra cost.

The new Dove's increased performance includes speed-range combinations with 45-minute reserves varying from 210 mph.-1,140 miles to 182 mph.-1,412 miles. Standard fuel capacity is 264 U. S. gallons, with oil capacity of 9 gallons per engine.

At a gross weight of 8,950 lbs., useful load is 3,005 lbs. for radio, fuel, oil, people and baggage, the equipped weight being 5,945 lbs. and including all equipment except radio.

With its new and more powerful engines, the new Dove takes off over a 50-ft. obstacle within 1,750 feet and lands over a 50-ft. obstacle within 1,800 feet. Its sea level rate of climb is 1,135 fpm. and service ceiling is 21,900 ft. Single-engine performance includes 295-fpm. sea-level rate of climb and 8,950-ft. absolute ceiling, all at gross weight.

Engines are the new de Havilland Gipsy Queen 70 Mark 3 type, rated at 400 hp. each at take-off at 3,000 rpm. and 47 inches of manifold pressure. As compared to the Mark 2 engines formerly used on the Dove, the Mark 3 is rated at 2 inches more manifold pressure, has a heavier crankshaft, new-type cylinder heads and other refinements, including a new power priming system which simplifies engine starting in all conditions and eliminates the need for fuel lines terminating in the crew compartment. The Gipsy Queen 70 is supercharged and equipped with fuel injection.

An ejector-type exhaust system with large exhaust augmentor tube is featured by the new engine installation. It utilizes the exhaust gases for a pumping effect to pull cooling air through the nacelle, thus providing for a reduction in nacelle drag and a useful, though unspecified, amount of thrust. The nacelle also has a larger oil cooler intake scoop, located just above the propeller hub, with a longer outlet.

In addition to the new low-drag engine cowling, the new Dove features a new cockpit canopy. The dome of the canopy is raised 5 inches higher

Larger cockpit canopy not only provides more room for crew but adds larger side windows for more visibility.

—(FLIGHT MAGAZINE Photo.)

than on previous models, providing additional cockpit headroom. This new dome is the equivalent of that on the 4-engine Heron and also provides greater visibility, having larger side windows.

The new cockpit has a new single-piece instrument panel, with effective grouping of flight, radio and engine units. Cockpit lighting is new. A new type of pneumatic brake control has been introduced to make ground handling easier and more precise.

Standard equipment in the Custom 800's price and weight is a luxurious, customized Horton & Horton 6-seat cabin interior, complete with two folding card tables with center leaf to span full cabin width, fittings and cushions to easily convert four of the chairs into 2 beds, chemical toilet in a custom-styled and upholtered bench seat, a flush-fitting lavatory with large vanity mirror and thermostatically-controlled heated 2-gal. water tank for the lavatory, flush-fitted coffee service and other features formerly available only as optional equipment at extra cost.

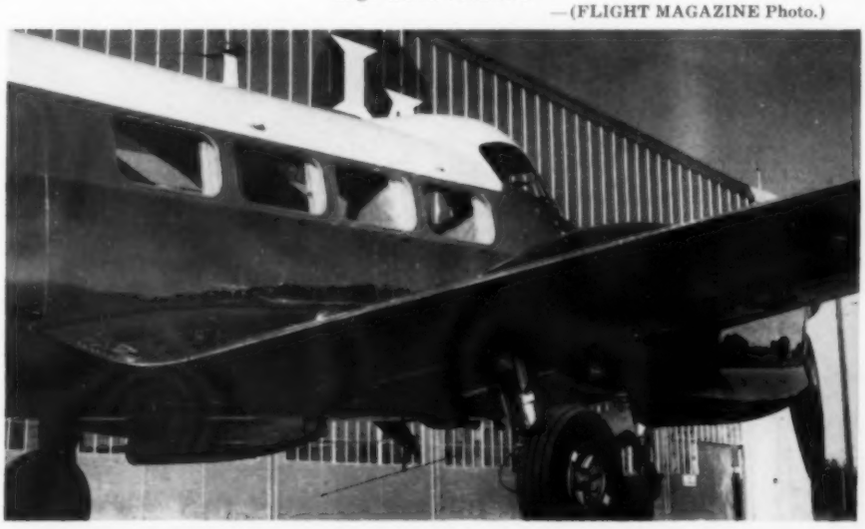
Also formerly an extra but now standard in the Custom 800 is a 62-gal. auxiliary fuel system at no extra cost. It brings the Custom 800's standard fuel capacity up to 264 U. S. gallons.

Approximately 500 Doves are in world-wide use, of which 80 are in the United States, 14 in Canada and 6 in Mexico. The Dove was designed by de Havilland Aircraft in England as a small airliner and certificated to

(Continued on page 36)

Large exhaust augmentors provide improved engine cooling on Custom 800. Note large cabin windows.

—(FLIGHT MAGAZINE Photo.)



de Havilland Dove Custom 800

Factory Data

Price	**$129,850**
Total Hp. (2 Gipsy Queen 70 Mk 3)	**800**
Gross Wt., lbs.	**8,950**
Equipped Wt. (incl. aux. fuel system, all cabin and toilet furnishings, but less radio), lbs.	**5,945**
Useful Load, lbs.	**3,005**
Useful Pct. of Gr. Wt., %	**33.6**
Fuel Cap., gals.	**254**
Oil Cap., gals.	**18**
Max. Speeds, mph.-alt., ft. —	
	222-SL
	235-5,250
	223-10,000

Cruising Performance —

Hp. Per Eng.	Mph. Alt., Ft.	Miles Plus 45 Mins.
265	210- 8,000	1,140
245	197- 5,000	1,168
245	208-10,000	1,233
230	192- 5,000	1,225
230	203-10,000	1,295
215	186- 5,000	1,284
215	197-10,000	1,360
200	180- 5,000	1,347
200	190-10,000	1,422
185	173- 5,000	1,412
185	182-10,000	1,447

Stall Spd., gear, flaps down, mph.	**75**
Stall Spd., gear, flaps up, mph.	**94.5**
Rate of Climb, fpm.	**1,135**
SE Rate of Climb, fpm.	**295**
Service Ceiling, ft.	**21,900**
SE Service Ceiling, ft.	**7,700**
Take-off Dist. over 50-ft. Obst., ft.	**1,750**
Land. Dist. over 50-ft. Obst., ft.	**1,800**
Span, ft.	**57**
Length, ft.-ins.	**39-3**
Height, ft.-ins.	**13-4**
Wing Area, sq. ft.	**335**
Wing Loading, lbs.-sq. ft.	**26.7**
Power Loading, lbs.-hp.	**11.2**
Cabin L-W-H, ins.	**147-54-63**
Lavatory Compt. L-W-H, ins.	**33-54-63**
Cabin Door H-W, ins.	**51-32**
Bag. Compt. Vol., cu. ft. (front 22, rear 35)	**57**
Bag. Compt. Cap., lbs.	**900**

NOTES: Performance is for gross weight at sea level unless noted. Standard price and weight are for completely-equipped airplane including 6 cabin seats and customized cabin furnishings, not including radio.

Formerly known as the Skimmer, the new 4-place, 180-hp. Lake L-4 amphibian is the only all-metal single-engine amphibian in production. —(Lake Aircraft Photo.)

Lake L-4 Amphibian

LAKE Aircraft Corporation at Sanford, Maine, is now demonstrating its improved 4-place Lake L-4 amphibian, which features a new V-bow and keel line for better water handling.

The L-4 is powered by a 180-hp. 4-cylinder Lycoming O-360-A1A engine installed in a pylon atop the fuselage and driving a pusher propeller (72-inch metal, constant-speed Hartzell). It is the only all-metal, single-engine amphibian in production and is priced at $24,995.

With an empty weight of 1,575 lbs. and a gross weight of 2,400 lbs., the L-4 has a useful load of 825 lbs. Normal fuel capacity is 30 gals. and maximum fuel capacity is 40 gals. Oil capacity is 2 gals.

At gross weight, the Lake amphibian's cruising speed on 75% horsepower is said to be 131 mph. Stall speed is 50 mph. Normal range is 500 miles in 4 hours with 40-gal. capacity.

Take-off distance from land is 650 ft. and from water is 1,125 ft., with landing roll of 475 ft. on land and a landing run on water of 600 ft. Sea level rate of climb is 800 fpm.

John F. Strayer, president of Lake Aircraft, reports the amphibian's performance actually exceeds his claims for it, specified performance being intentionally conservative to allow for higher temperatures and altitudes than those normal to Sanford, Maine, where

Retractable tricycle landing gear enables Lake amphibian to taxi onto shore. Main wheels can be extended to aid in water handling. —(Lake Aircraft Photo.)

Lake amphibian breaks ground within 650 ft. on land and within 1,125 ft. on water and landing run is less than 600 ft. for either water or land operation. —(Lake Aircraft Photo.)

the aircraft is manufactured. "We usually get off the water within 800 ft. and off the ground within 450 ft.," Strayer said.

The Lake L-4 is a development from the Skimmer amphibian. Lake Aircraft acquired the Skimmer in October, 1959, from Colonial Aircraft at Sanford and has established production facilities in a 33,000-sq. ft. factory at Sanford which Lake acquired in March, 1960. Eventual production of 200 aircraft per year is planned.

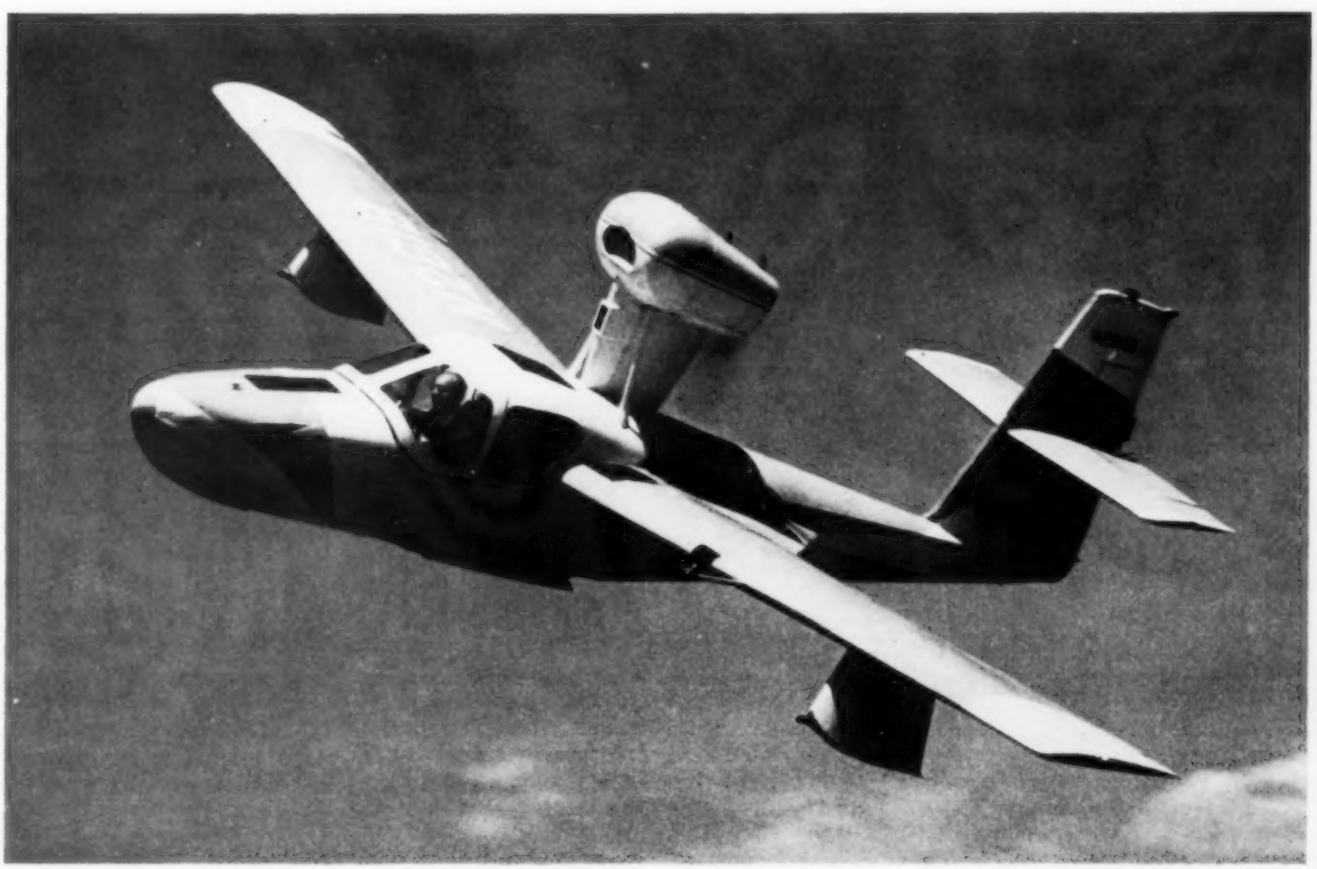
LA-4 Lake Amphibian

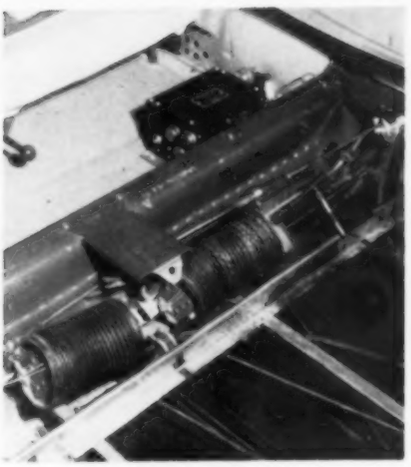
Factory Data

Price	**$26,500**
No. Seats	**4**
Horsepower (Lyc. O-360-A1A)	**180**
Gross Wt., lbs.	**2,400**
Empty Wt., lbs.	**1,575**
Useful Load, lbs.	**825**
Useful Pct. of Gr. Wt., %	**34.4**
Fuel Capacity, gals.	**40**
Oil Capacity, gals.	**2**
Cr. Spd., 75% hp. @ 6,000 ft., mph.	**131**
Stall Speed, mph.	**50**
Range @ 131 mph., mi.	**500**
Rate of Climb, fpm.	**800**
Take-off Run—	
Land, ft.	**650**
Water, ft.	**1,125**
Landing Roll-Run—	
Land, ft.	**475**
Water, ft.	**600**
Span, ft.	**38**
Length, ft.-ins.	**24-11**
Height, ft.-ins.	**9-4**
Wing Area, sq. ft.	**170**
Wing Loading, lbs.-sq. ft.	**14.1**
Power Loading, lbs.-hp.	**13.3**

NOTE: Performance is for gross weight at sea level unless noted.

Trim lines of Lake amphibian show its new and longer V bow. Hinged at center post, large windshield is used as door. —(Lake Aircraft Photo.)





Griswold Lateralizer components are shown above, being wingtip orifices (top), control head (center) and servo bellows. Photo at right shows bellows attached to aileron controls in Beech Bonanza.

Simple Bellows System Keeps Wings Level

AN inexpensive automatic stabilization system to keep a lightplane's wings level in flight has been produced after five years of intensive research and development work by Roger W. Griswold II, president of Griswold Aeronautical Corp., Groton, Connecticut. The Federal Aviation Agency on July 1 issued a supplemental type certificate to Griswold approving installation of his device in the firm's Beech D35 Bonanza. Patents are pending and it is trademarked under the name of "Lateralizer."

A complete departure from the use of gyros or gyro output for stability reference, the Griswold Lateralizer uses aerodynamic measurement as a stability reference by gauging the pressure differentials in the airflow beneath the wingtips. When the airplane is flying straight and level, the airflow pressures under the wingtips are equal, but if the airplane is banked or yawed, the airflow pressures become unequal. Griswold's device detects and measures such pressure differentials between the wingtip airflows, utilizing the differential to bring the pressures back into equilibrium by automatic aileron movement.

In the Lateralizer system, a small streamlined orifice is fastened to the underside of each wing near the tip. A plastic tube connects each orifice to a control head in the cockpit. This control head contains a silicone diaphragm, which amplifies the pressure changes sensed by the orifices and, in turn, valves a suction flow from the aircraft's vacuum system (if the aircraft does not have an engine-driven vacuum system, a standard 4-inch venturi may be used or a special small venturi supplied when necessary with the Griswold installation kit). The valve-regulated suction actuates a servo bellows connected to the aileron cable, and any displacement of the aircraft from straight and level flight is thereby immediately corrected by proportional aileron movement.

An "on-off" knob is located on the control head, as well as a "trim" knob to trim the aircraft and to compensate for possible variation in wing incidence, deficiencies in aileron rigging and unequal fuel loads in the wings.

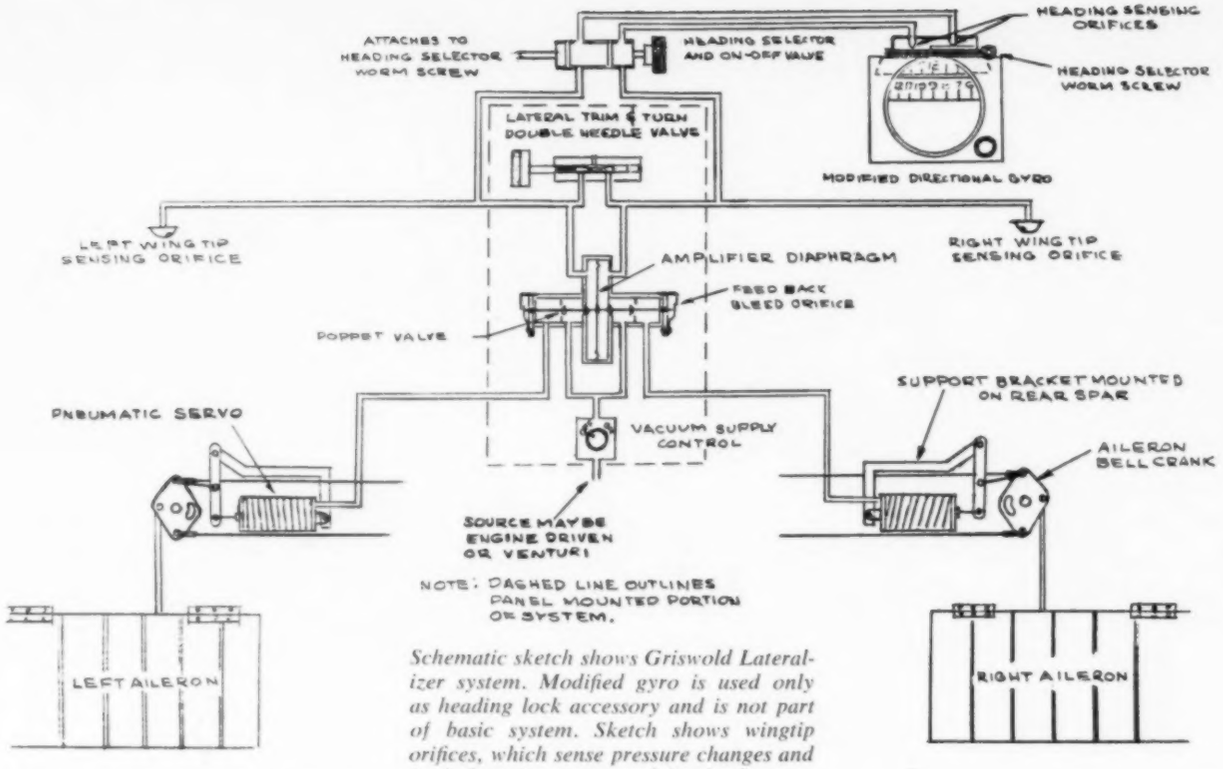
In-flight function of the Lateralizer maintains the airplane in straight and level flight, both in turbulence and in smooth air, and holds the heading of the airplane depending on the degree of turbulence. In practical use, the Lateralizer provides the pilot with freedom to relax, to check radio frequencies, attend to navigation or other chores with the knowledge that the Lateralizer will keep the wings level and thus eliminate the airplane's inherent tendency to lower a wing. Turns of varying degree of bank may be made with the trim knob.

The calibrated rate-of-roll recovery of the Griswold Lateralizer is 6-8 degrees per second from any bank angle, and the aircraft will recover from a banked turn to a "dead-beat" level flight with no oscillations or excursions, Griswold says. Since the system is pneumatic, there is no warm-up time and the pilot may over-control it with ease and without harm to the system — over-riding pressure is similar to that used in holding an automobile in a turning circle.

Griswold says there is every indication that his Lateralizer is completely reliable and will need no maintenance with the exception of cleaning the heading lock valve every 500 hours (valve cleaning is a 30-minute job by any mechanic). Installation time is estimated at 15 man-hours in the Bonanza or Debonair or in any of the single-engine Cessna models. A Gris-

Griswold Lateralizer control head below is installed in Beech M35 Bonanza. It has on-off control and trim knob.

Griswold heading lock in M35 Bonanza has modified gyro with heading selector knob and heading card above gyro card.


ATTACHES TO HEADING SELECTOR WORM SCREW
HEADING SELECTOR AND ON-OFF VALVE
HEADING SENSING ORIFICES
HEADING SELECTOR WORM SCREW
LATERAL TRIM & TURN DOUBLE NEEDLE VALVE
MODIFIED DIRECTIONAL GYRO
LEFT WING TIP SENSING ORIFICE
AMPLIFIER DIAPHRAGM
RIGHT WING TIP SENSING ORIFICE
FEED BACK BLEED ORIFICE
POPPET VALVE
SUPPORT BRACKET MOUNTED ON REAR SPAR
PNEUMATIC SERVO
VACUUM SUPPLY CONTROL
AILERON BELL CRANK
SOURCE MAYBE ENGINE DRIVEN OR VENTURI
NOTE: DASHED LINE OUTLINES PANEL MOUNTED PORTION OF SYSTEM.
LEFT AILERON
RIGHT AILERON

Schematic sketch shows Griswold Lateralizer system. Modified gyro is used only as heading lock accessory and is not part of basic system. Sketch shows wingtip orifices, which sense pressure changes and feed them into a control head where an amplifier diaphragm valves a suction flow to actuate servo bellows for corrective aileron action. By keeping wingtip air pressures in balance, system keeps wings level.

wold mechanic has installed the system in a Cessna 172 in 3 man-hours and it is believed that the 15-man-hour estimate will be reduced substantially after several field installations. No in-flight calibration is necessary.

The Griswold Lateralizer weighs less than 8 lbs. and the complete kit is priced at $390. It is thus the most inexpensive automatic stabilization device ever marketed and is easily the simplest and least-sophisticated. Griswold says it is now FAA-approved in the D35 Bonanza and Cessna 150 and is expected to be approved soon for the Cessna 172 and 182 as well as the complete Bonanza series and the Debonair.

As an additive or accessory for the Lateralizer, Griswold also offers a heading lock attachment, which also uses the pneumatic principle by modifying a standard directional gyro with a heading selector knob and a heading card just above the gyro card. Rotation of a cam plate attached to the gyro card is sensed by pressure nozzles at the top of the unit. The heading lock attachment is said not to interfere with the standard function of the directional gyro and preserves the gyro's TSO as a separate unit. The heading lock functions through heading selection changes of 175 degrees. Weight of the heading lock attachment is 4.75 lbs. and price is $485.

Allan Heinsohn, sales manager for Griswold, has been demonstrating the Lateralizer with heading lock in the company's D35 Bonanza. Demonstrations show that it is free from drastic or extreme control movements and it can not be confused by attempts to mislead it with intentionally crossed controls or skidding turns. As expected, the orifice-pick-ups under the wings near the tips become more effective as airflow pressure changes become more pronounced. In vigorous wing displacement as in turbulence, for example, the pressure change is more quickly detected than in a slow and gradual dropping of a wingtip. Automatic aileron reactions are not zip-zip-zip as with conventional autopilots but are gradual. Watching the suction-operated bellows beneath the rear seat in the Bonanza, the observer sees them gently expanding and contracting accordion-fashion to actuate the aileron cables and cancel out oscillations. On the ground with the engine running, the observer can watch them respond when somebody under the wing blows into one of the orifices.

Griswold's major accomplishment with his Lateralizer is to get completely away from both the gyro and electronics in his effort to simplify automatic stabilization at lowest possible cost. All kinds of gyro-linked devices have been perfected since Bill Lear achieved the pioneering low-cost and lightweight autopilot breakthrough with his L-2. But Griswold's Lateralizer is the first complete departure — its basic wing leveler without heading lock attachment can go into the simplest of lightplanes with only a venturi to provide suction — no gyro installation is needed.

Lightplane stabilization through aerodynamic measurements has long been sought by experimenters. Most of them, however, with the exception of Griswold, gave up their experiments after Lear's L-2 breakthrough started the trend of utilizing the gyro's stability information. One of the experimenters with aerodynamic measurements in earlier years was Fred Weick, daddy of the Ercoupe project and now head of Piper Aircraft's research and development institution at Vero Beach, Florida.

Weick considered an aircraft's inherent spiral tendency as objectionable to lightplane acceptance as the tailwheel landing gear. He studied simple ways to achieve automatic flight stability to eliminate spiralling. He used a bellows system in experiments to detect and measure the airflow pressure changes beneath the tips of a banked or yawed wing. One of his findings was the inertia effect in a turn, in which the air itself in the tube to wingtip orifice tended to be forced toward the faster-moving wingtip. Then Weick went from the bellows to a weight installed in the cockpit as a pendulum device. He was well along in his experiments when they were shelved so that he could concentrate all of his efforts in the development of an agricultural aircraft de-

(Continued on page 38)

Aerial view shows Addison Airport's main runway and hangar line at top, with terminal omni range station near tower center. Three million-dollar private airport embraces 440 acres.

Private Airports CAN Make Money

By GEORGE E. HADDAWAY

THEY said it couldn't be done.

When Addison Airport at Dallas opened for business in October, 1957, skeptics were a dime a dozen, predicting one of two things — either the backers would get tired of pouring money into the field or turn it into industrial sites. You just can't make money out of a fancy, private airport, they said.

Less than three years old, Addison is now operating in the black. Expansion is going on, new hangars are being constructed and last month the first dirt was turned for construction of an air traffic control tower to cost the airport $90,000 and to be staffed by FAA air traffic controllers.

A total of 170 single and multi-engine business airplanes are based on the field. A conservative estimate of their market value is in the neighborhood of $7 million. All are late-model airplanes of four-place or larger size with the exception of four new 2-place Cessna 150's operated by Dal-Tex Aviation, the Cessna dealer.

When the current hangar and traffic control tower construction is completed and when the balance of the land under purchase option has been bought, the backers will have a total investment of $2,147,000. Another $750,000 has been invested by tenant concerns in facilities at the field on leased land. That's approximately $3 million for total investment. The owners declare they will continue to add improvements and facilities as required. A large number of acres yet to be bought (now under option) will be turned into industrial sites for companies desiring an airport location. That the owners intend for Addison to be a permanent airport is borne out by the fact that some of the leases are for a period of fifty years.

Somehow the skeptics have all disappeared.

What's more, Addison Airport is rapidly becoming the national model for private airport investment if the

Addison's terminal building for private fliers and its ramp are pictured as planes arrive near sunset. Cessna 310 and Bonanza at left are being towed to hangars while two transients near top are being fueled.

Sketch above shows new control tower being constructed by Addison Airport following ground-breaking ceremonies (right). FAA will operate it. At left are W. T. Overton, president; T. L. Wynne, Jr., director, and Manager Henry Stuart of Addison Airport, Inc.

flood of inquiries and visitors seeking information is taken as an index. With the constantly increasing traffic in high density areas, nothing could be more advantageous to aviation development at this time than to attract private capital into airport construction and operation. The success formula found and applied by the backers of Addison Airport should prove a stimulus in this regard.

Seven young men, all pilots and all 40 years of age or under, own and guide the destinies of the Addison Airport, Inc., enterprise. They are W. T. Overton, president, John D. Murchison, T. L. Wynne, Jr., John S. Brown, W. D. De Sanders, James I. De Loache and Henry Stuart. Stuart is corporation secretary, vice president and general manager of the airport.

There's nothing particularly fancy about Addison except that it is completely new and modern in every respect and service is geared to requirements of today's business airplane owner. It's one of the few airports we've ever seen without any "dead" tie-down aircraft or junk pile. It's clean and utilitarian.

With management and ownership in the hands of active pilots and plane owners, they take extreme pride in providing the kind of service they always wanted but rarely received before they went into the airport business. Owners' aircraft are towed to the terminal building ramp upon call. On landing, the owner parks at the terminal building where his plane is serviced and towed back to storage.

The airport handles all gas and oil sales despite the fact it might be more profitable to permit the various operators on the field to dispense such services and simply take a percentage. However the standardized system of a single fuel dispensary has advantage from the customers' standpoint which far outweigh any advantages of multiple gas pits and several competitive operations. One of the unique features of gas and oil servicing at Addison is that all the line men are on a commission basis, hustle for business and take pride in efficiency. Not long ago a transient Twin-Beech pilot called in on Unicom, stating he was in a terrible hurry and could Addison gas him in ten minutes? The line crew said they'd buy him a new hat if they couldn't get him out in five! Little wonder the word is getting around and transient business is on a steady increase.

Gas and oil sales account for 42 per cent of the gross income. The balance is broken up into 26 per cent for hangar rental, 25 per cent for land lease income and 7 per cent for miscellaneous, which includes concessions to the restaurant operator, a farmer and Avis car rental. Gasoline sales doubled during the second year over the first year and it appears that the current period (third year of operation) will show a 31 per cent increase over the second year. Approximately 27 per cent of gas and oil sales are to transient aircraft. Twenty-four months ago it was less than 10 per cent.

The big news around Addison is the control tower now under construction. Little did the backers realize that traf-

(Continued on page 38)

Air-conditioned terminal for private fliers at Addison Airport has comfortable lobby (left, below), offices and restaurant (right).

IFR TRAINING FOR NON-RATED PILOTS - - - A DEADLY FALLACY BY FAA THEORISTS

By JOSEPH E. COULTER

EDITOR'S NOTE: *The author is chairman of the Department of Aviation at the University of Oklahoma, which has been training more than a hundred pilots each year since 1946. He has been flying and instructing instruments for eighteen years. In addition to his rank of Associate Professor at the University, he holds currently effective certificates as Commercial Pilot (ASE-MEL and Instrument), Flight Instructor, Instrument Instructor, Ground Instructor (ratings in all subjects), Control Tower Operator, and Aircraft and Engine Mechanic. Usually a staunch supporter of CAA-FAA policies, in this article Mr. Coulter takes issue with the recent revision of the Civil Air Regulations requiring instrument training for Private Pilots.*

IT was late in the evening and the State Trooper was at home for a change. As his son, Bob, wandered through the living room on his way to the kitchen for a bedtime snack, the Trooper said:

"Bob, sit down, I want to talk to you. You'll be sixteen next month, won't you?"

"Yes, sir."

"You've completed the driver training course at school and you want to get your driver's license as soon as possible."

"That's right."

"Well, I've been talking to a friend of mine and doing some thinking on my own and this is what I want you to do. Before you get your license, I want you to learn how to drive ninety miles per hour, on slick pavement at night — in either fog or heavy rain."

"What!"

"That's right. I don't talk about it much at home, but I know from my own experience as well as the statistics at headquarters that a great number of accidents occur and thousands are killed each year under just those circumstances. Not only youngsters like you, but older folks as well."

"I can't believe you're serious," said Bob. "In the first place, it's illegal and you are sworn to enforce the law."

"That's right, son," said the Trooper, "but I've talked to some of these accident victims — the ones that lived — and it seems that they all knew better than to drive at that speed under these conditions but for one reason or another they found themselves inadvertently in that position."

"But how can anyone inadvert — well, accidentally get himself in that position?" asked Bob.

"Well, in one case I remember, a businessman felt he had to get where he was going to keep an appointment. He was lucky; he kept the appointment three months later. Another time a young fellow, not much older than you, was hurrying home so his mother wouldn't worry about him being out on the road in bad weather. They all have very reasonable explanations. Yes, son, we've got to see that this doesn't happen to you. We've got to make you a safe driver."

Dumbfounded, Bob said, "Now let's get this straight, Dad. You want to take me out and teach me how to do something that is extremely dangerous to myself and everyone else. Something that is in violation of every law on the books?"

"It may not be quite that bad. As my friend pointed out, we Troopers do it quite often as a part of our work."

"But, Dad, you guys are professionals. You live in those cars."

"I know, but you must understand that while I want you to know how, at the same time I'm telling you that it's illegal and dangerous and you're not to do it. So there."

"Well, Dad, if you say so, I'll do it. But who is this friend of yours that put this wild idea into your head anyway? It's the craziest idea I ever heard of."

"His name doesn't matter, but he works for the Federal Aviation Agency and he tells me that is the way they are training airplane drivers now."

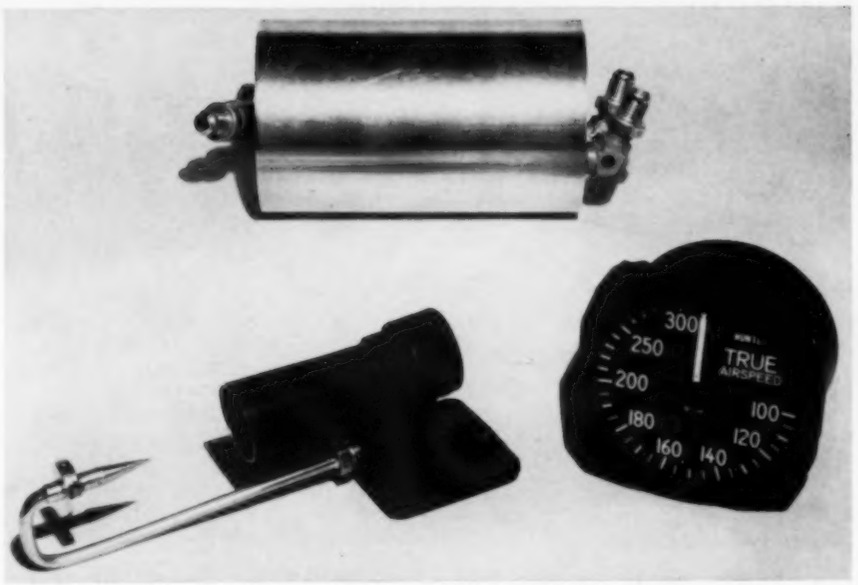
THE fallacy of the Trooper's reasoning is obvious; not so obvious but just as fallacious is the reasoning of those in the Federal Aviation Agency responsible for the Civil Air Regulations Amendment 20-12. Fortunately, the motoring public is not likely to be affected by the influence of our fictional Trooper but everyone who dares leave the ground is imperiled by this one farcical act of the FAA.

Not only is Amendment 20-12 dangerous, but unluckily for those directly affected by it, is cloaked in the mantle of safety, which grants it a degree of immunity from criticism. Any measure which is labeled "in the interest of safety" automatically puts its critics at a disadvantage. For anyone in aviation to be against anything bearing this label puts him in the same category as those who are against motherhood, the flag, and democracy. Consequently, any crackpot who can get a "safety" label attached to his pet idea has the battle for acceptance half won. Every facet of the aviation industry throughout its lifetime of government regulation has been faced with this same problem. (How well do the manufacturers know this! How forcefully has it been impressed upon the airlines!) While this is not the first time we in pilot training have faced the problem, this is the first occasion for us to be alarmed. The inherent dangers, the insidious nature, and the potentially disastrous results of Amendment 20-12 are sufficient reasons for us to be deeply concerned.

When this regulation was first proposed by the Civil Aeronautics Board as Draft Release 58-2, many of us protested vigorously. These protests pointed out the obvious. First of all, violations of a regulation prohibiting instrument flight by non-rated pilots certainly did not call for additional training to make such violations safer. Secondly, the small operators and private owners of light aircraft would be faced with two almost insoluble problems: (1) thousands of light planes are not — and cannot be — equipped for safe instrument flight and (2) those that can be outfitted but need not be (except for the regulation) create unnecessary economic hardships.

These objections are justifiable ones and should have been sufficient in themselves to forestall the issuance of Amendment 20-12. But, however great their validity, they are not the most important objection to be made. Probably the greatest number of protests that have been made are based on Alexander Pope's maxim "a little learning is a dangerous thing" — words just as true now as they were in the early eighteenth century. For example, in aviation's early days, flight training was normally ended when a

(Continued on page 36)



Hunter true airspeed system has three components weighing one pound. They are a small venturi unit, compensator unit which corrects for temperature and altitude, and panel-mounted true airspeed indicator.

True Airspeed Indicator

A SIMPLE one-pound true air speed indicator has been perfected and marketed by a former flight instructor who tired of explaining to students why indicated airspeed always has to be corrected to find out how fast an airplane's true airspeed actually is under varying temperature and altitude conditions. But after 10 years of development, most buyers of the device are not students at all — they're aircraft salesmen who can use it to show their prospects they really can fly at the speeds advertised, which are not IAS but always TAS.

"A true airspeed indicator is what everybody who flies has longed for all these years but it takes an airplane salesman to visualize its value without much persuasion," says Cecil Hunter of Tulsa, Oklahoma, who makes a sale practically every time he takes an ambitious airplane peddler up to 8,000 to 10,000 feet and trims his Mooney Mark 20 out for cruising flight. He can show 170 mph. without hauling out a computer and feeding in all the variables to argue he's flying as fast as he is.

"I put one on a Cessna 310 and it'll point to 218 mph. with no computer problems at all," says Hunter. "That usually is all it takes to sell a quick installation. People like to see 218 on the indicator instead of 185 when they are really doing 218."

Hunter prices his true airspeed indicator kit at $250 retail, and it takes a mechanic an hour and thirty minutes to hook it up. It takes only two or three check flights to calibrate it. Hunter's indicator does not replace the airplane's IAS indicator but is used only as an auxiliary or supplementary indicator.

The Hunter true airspeed system consists of three lightweight units, installation adding only 1 lb. of weight to the airplane. These are (1) small venturi unit, (2) compensator unit and (3) indicator. On a single-engine airplane, the venturi is mounted under the wing near the landing gear, with the small compensator unit just above it inside the wing, both units using a common base plate. A single, small plastic tube connects the compensator with the panel-mounted Hunter true airspeed indicator in the cockpit. On a multi-engine aircraft, the exposed venturi unit and concealed compensator are mounted on the left side of the nose and connected by a small plastic tube to the panel-mounted indicator.

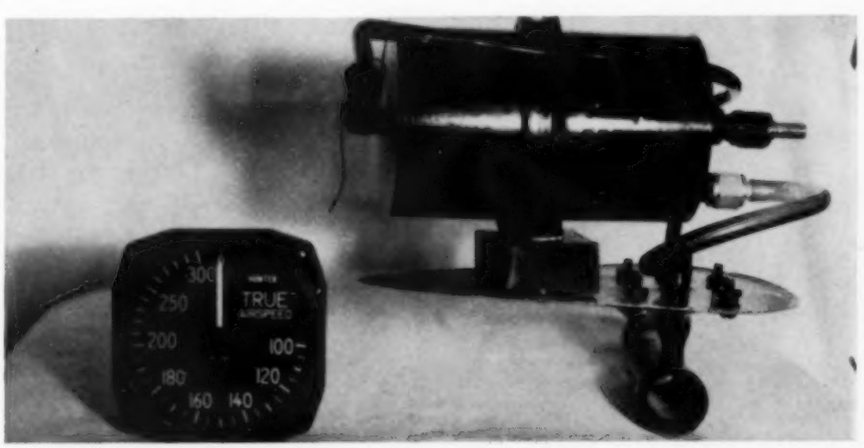
Inside the compensator unit are a small heat-sensitive bi-metallic arm, which acts as a thermostat to adjust a tiny valve for temperature effect, and a small aneroid, which adjusts the valve for altitude effect. Thus the plastic tube from this compensator furnishes the indicator a corrected static pressure and this provides the true airspeed. The indicator markings begin at 100 mph., so that its usefulness is confined to speeds above that figure.

As to drag from the exposed venturi, Hunter said it is negligible. As to icing of the exposed unit, he said this converts it into an excellent indicator of icing conditions. "Whenever the TAS indicator begins to drop away towards the IAS indicator in cruising flight, it is a sure sign of icing and the pilot can begin precautionary action before he might otherwise detect the onset of icing conditions," Hunter says.

Use of the TAS indicator is especially valuable in keeping an airplane trimmed for efficient cruising. It will show small changes in TAS of 5 to 8 mph. when the IAS indicator barely moves, thus telling the pilot to get back on the step.

But the big usefulness is by salesmen or others who devote their time and flying to proving the manufacturer's advertised performance can be delivered by the airplane. Since most people who fly are aircraft salesmen,

(Continued on page 36)



Compact Hunter unit for single-engine planes is mounted beneath wing just outboard of landing gear, with common base plate for venturi and compensator. Note TAS indicator scale begins at 100 mph.

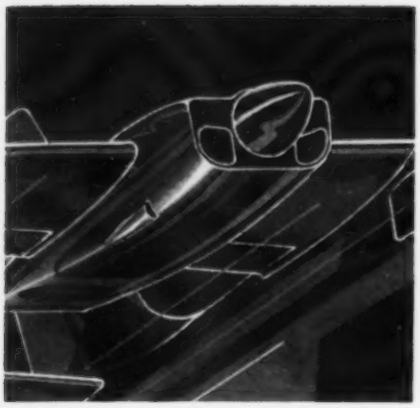
SAFER
FASTER
SMOOTHER
QUIETER

another all-new

560

featuring the new, compact SPEED-LINE NACELLE

AERO DESIGN & ENGINEERING CO, BETHANY, OKLAHOMA • Subsidiary of ROCKWELL-STANDARD Corporation



Aero Commander 560F

SAFER

The 560F features a service ceiling of 21,900 feet—single engine, 10,300 feet! Stall speed, gear and flaps down, is 66 mph! Short field take-off requires only 1,070 feet—sea level rate of climb is 1,750 fpm! The 560F—with normal fuel—will span 1,500 miles with a 30-minute reserve.

FASTER

New Lycoming IGO-540 FUEL INJECTION engines deliver 350 hp! Added power and SPEED-LINE design increase the top speed to a *fast 250 mph*—cruise, 234 mph! Yet the new gross weight is 7,000 lbs—2,430 lbs of useful load!

SMOOTHER

Propellers dynamically balanced *on the engines*, new forged engine mounts and a raised thrust line combine to produce a new smoothness in flight! Now the famous-for-stability Aero Commander provides even *greater flying comfort!*

QUIETER

A new over-the-wing exhaust system reduces engine noise at the source and carries it up and aft of the cabin. This feature plus new sound insulation makes the cabin *whisper-quiet!* There's new interior luxury, too, in the elegant blending of rich fabrics and genuine leather in your choice of color combinations.

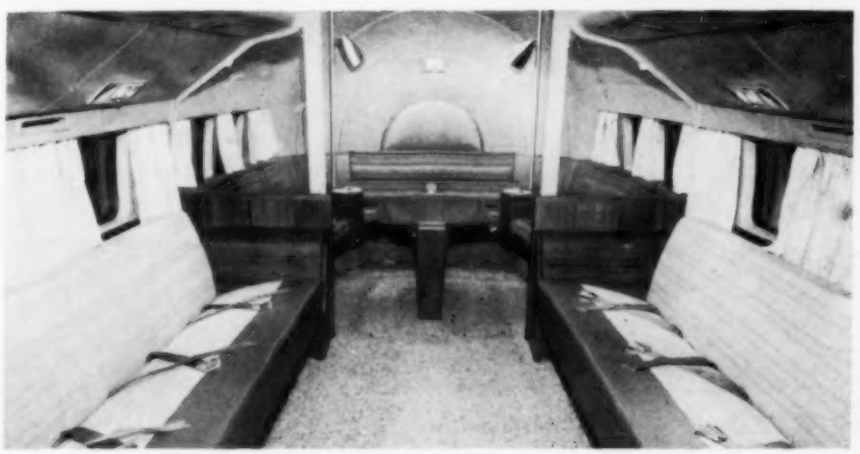
VISIT YOUR NEAREST DISTRIBUTOR SOON—or write today for complete details on the all-new 560F! Aero Design & Engineering Co., Bethany, Oklahoma

This corporate DC-6B will be used to carry key personnel to offices throughout the world.

First DC-6B for Executive Flying

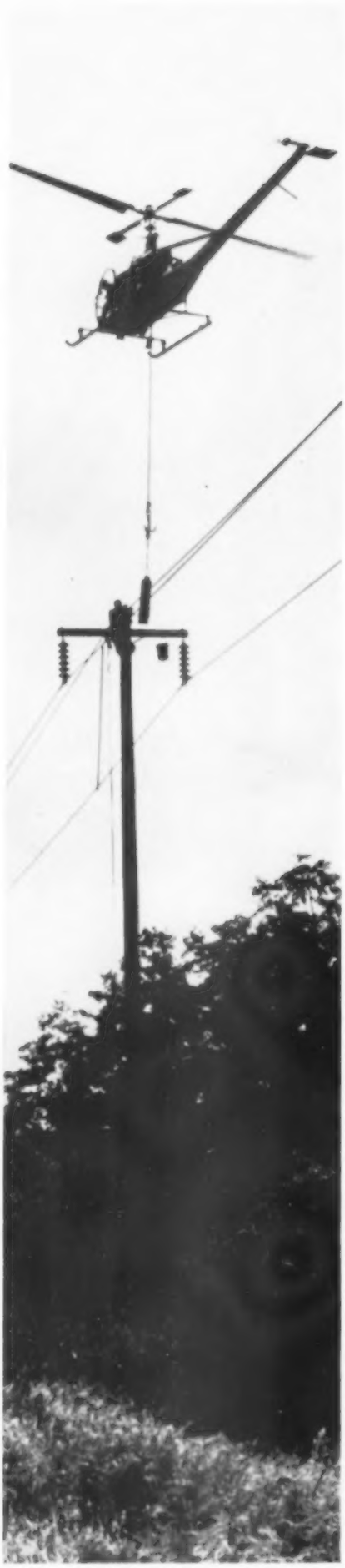
THE largest business aircraft ever completely converted for executive transportation is a Douglas DC-6B which AiResearch Aviation Service at Los Angeles International Airport delivered recently after thorough modification to custom requirements. Its owner will use it for transportation of key personnel to offices throughout the world. The four-engine former airliner was purchased from Frederick B. Ayer and Associates, New York dealer in corporate aircraft.

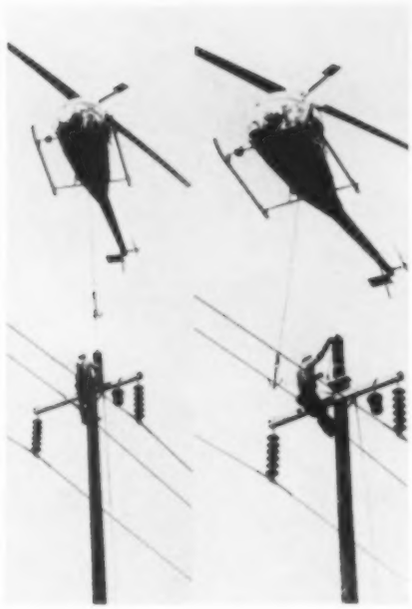
As customized by AiResearch, the big interior accommodates 36 passengers and crew. The spaciously-arranged cabin includes berthable divans, swivel chairs, a large aft-located stateroom and lounge, galley, lavatories, crew rest area and navigator's station. Long-range high-frequency radio and a Sperry A-12 autopilot also were installed. The DC-6B carries its own specially-designed integral ladder for passenger boarding at airports where normal DC-6-type ramps are not readily available.



Custom interior views show furnishings looking forward (above) and aft (below). Paired seats are arranged with tables. Divans are berthable. Aft stateroom-lounge area is almost as large as entire cabin of many corporate aircraft.

—(AiResearch Aviation Service Photos.)





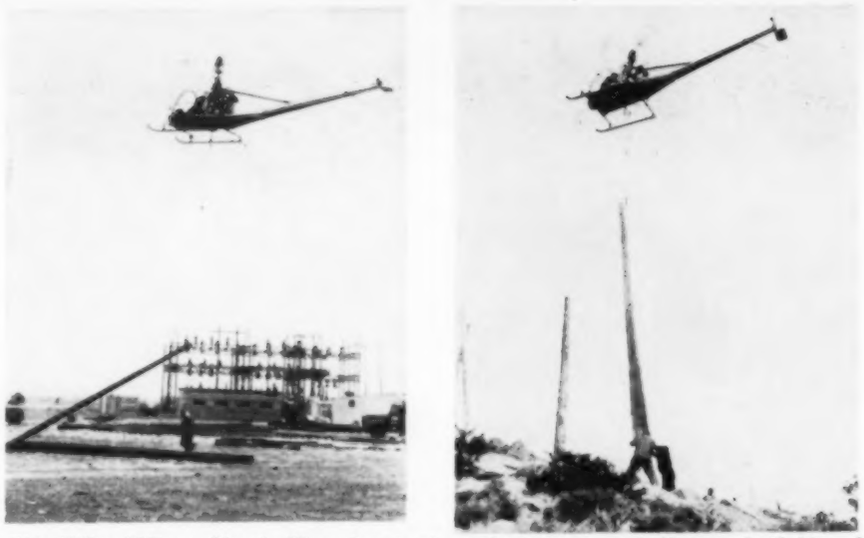
As a sky hoist, this Hiller 12E is shown lifting a 235-lb. insulator atop a power pole and positioning a line for the worker. Note loudspeaker on landing gear cross-bar. —(Hiller Aircraft Photos.)

More Work For Helicopters

EVER-WIDENING versatility of helicopters in aerial workhorse activities has been graphically demonstrated in recent projects pictured on these pages. They show the Hiller 12E helicopter performing power line work as a precision flying hoist and a Sikorsky S-55 performing the first helicopter aerial recovery of a package dropped by parachute from a passing airplane.

How a Hiller 12E solved a power line problem in Oregon for Portland General Electric Co. is detailed in the photos at left and above. To increase the power in a line from 60,000 to 115,000 volts, PGE had to replace 235-lb. insulators atop the poles — a task so difficult ground crews using gin poles could adapt only 4 poles a day. In hopes of faster work, the firm called in Columbia Helicopters of Portland, and Pilot Wes Lematta, working with 4 linemen, lost no time proving he could do the job quickly.

After lifting the conductor off the old insulator with a grappling hook slung beneath the Hiller's belly, the man on each pole would lower the old and lighter insulator. Then the Hiller would hover the new and heavier insulator gently and accurately in place as the lineman merely bolted it into position. Then the grappling hook was used to replace the conductor on the new insulator. After a series of 3 poles had been newly equipped in that manner, the helicopter then used the hook to remove the line from the next 3 poles to be serviced. Lematta used a small loudspeaker mounted on the helicopter's skid gear to talk with linemen while working — they used arm signals to talk back. The pilot and his 4 linemen changed 29 insulators in only 3 hours and 40 minutes of flying time as compared to the old gin-pole rate of changing only 4 insulators in an entire day from the ground.



This Hiller 12E, working in Wyoming, is pictured picking up a half-ton pole (left) and positioning it in a hole on a nearby mountain ridge (right).

—(Hiller Aircraft Photos.)

This was simple work, however, compared to the job performed with a 305-hp. Hiller 12E in Wyoming by Christler & Avery Aviation of Greybull. It served as a flying crane to hoist poles and string line for contractors caught by urgent deadlines in completely moving a U. S. Bureau of Reclamation power line climbing out of Shoshone Canyon from Buffalo Bill Dam near Cody, Wyoming, over Rattlesnake Mountain.

Although the Hiller 12E weighs only 1,700 lbs. empty, it was used to lift and carry poles weighing 1,100 lbs. each, gently and precisely lowering them into holes and footings. Once the poles were set, the helicopter was then used to string the lines. This was all accomplished in high country and when Morris Avery finished flying the construction job chores, the company reported he and the Hiller 12E performed more work in 3 hours than could be done by two 6-man ground crews in a full week.

These are but two recent examples of workhorse duties performed by helicopters, which are opening up new operational opportunities in hundreds of different applications. They are usually called in when the going gets toughest with conventional work methods. In areas where helicopter operators conduct thorough selling efforts, the whirlybirds usually demonstrate their advantages so convincingly that they are put to steady, routine work as a regular and dependable tool of hard-headed business managers.

Aerial Recovery Breakthrough

Sikorsky Aircraft and All American Engineering Co. recently sponsored demonstrations of the first helicopter aerial recovery of a package suspended from a descending parachute. An S-55 helicopter was used, equipped with a special All American Engineering recovery gear suspended beneath it.

Five air-to-air pick-ups were made, the Sikorsky whirling in above the parachute each time to snag its shroud lines and deliver the suspended package to a predetermined spot on the ground. The parachutes were dropped from a lightplane at an altitude of about 8,000 ft., with the recoveries being made at altitudes ranging from 1,000 to 6,000 ft.

The sponsors described the pick-ups as "a revolutionary new breakthrough in aerial recovery." They emphasized that the helicopter's maneuverability makes it possible to complete a pick-up on practically every pass. Even if a connection should be missed, the copter can easily complete several other passes so that recovery is virtually 100 per cent certain. It was also proved that the parachute and its package ride steadily beneath the helicopter, with no pendulum effect.

Sikorsky Chief Pilot D. D. (Jimmy) Viner, who flew the demonstrations, said the pick-ups posed no special problems from the pilot's viewpoint and that they proved the feasibility of the helicopter as an air pick-up vehicle.

Military officers who witnessed the demonstrations said it opens new possibilities for the recovery intact of small target drone aircraft and guided reconnaissance missiles, so that they may be used again and again without damage. Pilotless target drones are landed by parachute. Aerial recovery by helicopter would prevent landing damages to the expensive drones.

In aerial recovery of a parachuted package, a Sikorsky S-55 is shown at left approaching the parachute, snagging it with a pick-up gear, towing the 'chute and its package and depositing it gently at a predetermined landing spot.

—(Sikorsky Aircraft Photos.)

CUSTOM 800 DOVE

(Continued from page 23)

airline category requirements, with special emphasis on ease of maintenance for heavy airline utilization. While the Custom 800 for the U. S. market has a customized cabin interior, seating 6 passengers in plush comfort in addition to the crew of two, airline versions of the Dove seat up to 11 passengers in the cabin. The Dove is a completely integrated design — airframe, engines and propellers were designed for maximum efficiency as an integrated unit. All three are manufactured by de Havilland, which maintains world-wide factory follow-up service for operators of the Dove.

U. S. sales and service are handled by a de Havilland branch office at LaGuardia Airport in New York, with Ian Fossett in charge. Fossett will conduct a nationwide demonstration tour with the new Custom 800 this summer and fall. His demonstrator was delivered late in July after being customized by Horton and Horton at Ft. Worth.

TRUE AIRSPEED INDICATOR

(Continued from page 31)

whether they own up to it or not, Cecil Hunter should soon enjoy a land-office business with his TAS indicator. He now has the device on Cessna 310's and 180's, Aero Commanders, Mooney Mark 20A's and Beech Travel Airs and has scheduled Twin Beech, Douglas B-26 and Howard 500 installations. Pilots who operate pressurized aircraft at altitude are expected to be especially enthusiastic over a TAS indicator mounted in the cabin, where passengers can see they are traveling at 300-350 mph. instead of a slow IAS in the 200's for example. The higher their performance, the more selling a TAS indicator can do for them.

IFR FALLACY

(Continued from page 30)

student soloed. Since then we have learned that additional instruction is necessary because pilots with half-learned techniques have a strong tendency toward self-destruction. We should now, after more than a half century of aviation development, be foresighted enough to see that pilots trained under Amendment 20-12 will be victims of that same little learning. Relying with misplaced confidence on their so-called instrument proficiency, they will intentionally proceed into worsening weather conditions and meet with situations they are not trained to handle. Little do they know how quickly panic can build when one is actually on the gauges and not merely under a hood.

The problem which this amendment is supposed to correct — by, of all things, requiring instruction in how to fly in violation of Civil Air Regulations — might more logically have been solved by *a little more learning* about weather recognition, the use of weather reporting services, and the certain knowledge that violations would result in sure and swift punishment.

Any sensible effort on the part of the FAA to produce better and safer pilots should and will receive the support of us who are in the flight training business. Additional training in the recognition and avoidance of instrument weather, training in precautionary off-airport landings, greater emphasis on the penalties for violations — these measures would certainly be a better solution than the pseudo-instrument training now being foisted upon us. Most airplanes flying today are not stressed for inverted flight. Our students take our word for this and learn to keep them right side up. One wonders when some brain will decide we must teach acrobatics in non-acrobatic airplanes because some knotheads find themselves inadvertently upside down.

Regardless of how we feel about this farce being perpetrated on aviation, those of us responsible for the training of dozens of pilots each year are being forced to become a party to it. Not only must we prepare our students to pass this so-called instrument phase of the flight test, but we are also prohibited from teaching it in the least harmful manner. The regulation states that instrument instruction is to be given *before* and after solo. As it applies to Part 50, we are told to "provide for a portion of each dual flight for the express purpose of instrument instruction." Now as best I can tell, this whole scheme is based on some experiments at the University of West Virginia, on the basis of which it was decided that our fledglings should keep their heads half in-half out of the cockpit in pursuing this "integrated" system of training. For twenty years I have been preached to and have been preaching to keep one's head out of the cockpit and look around when flying VFR. If we must teach instruments to beginning pilots, shouldn't we be allowed a few hours to develop some safe flying habits before getting their attention inside the cockpit — or have we outlawed mid-air collisions? The FAA's right to spell out the requirements for the issuance of airmen's certificates is not in question, but it does appear that in attempting to specify when and how training should be given to prospective applicants the Agency may be exceeding its statutory authority. While this practice was carried on to some extent by the CAA, never have we been quite so forcefully impressed with such an all-inclusive regulation.

It might be well for some serious minded people in aviation to give some thought to what this regulation portends. In addition to the instrument requirement, this amendment also includes a requirement relative to two-way radio and air traffic control procedures. What do our aviation theorists have up their sleeves to pull out next? Are we moving toward the day when full instruments and electronic equipment will be required for aircraft certification? Are we coming to the end of VFR flying and moving into the age of one hundred percent control of all traffic, when we will no longer look out but just sit and monitor our little black boxes? For those of us who have "heard the wind" this is not a pleasant prospect. For others who like the freedom of flight it is a discouraging thought. Aviation under such circumstances will be for only the big and the rich.

But those worries are for tomorrow. We have our own problem here and now. We must either openly oppose this amendment to the Civil Air Regulations and by logical argument work for its rescission, or we must wrestle with our consciences and find a way to live with this asinine regulation. So far I have been unable to accomodate my thinking to accept it in word or spirit. In a business where life and death are so close, we feel a tremendous responsibility toward our students, both during and after their training. Our opposition is not the result of contrariness or resistance to trying something new. Being forced to participate in a practice which our judgment and conscience tell us is wrong poses an ethical problem. We cannot avoid responsibility by saying, "It's a regulation and we must comply." The indefinable someone who is FAA will not be the one whose soul will be seared. We must do our jobs with the full knowledge that every untrained, poorly trained, or in this case, mis-trained student, will come back to haunt us.

There is surely a better way to solve this problem. Now that we have improved weather services aided by en route pilot reports and increased communications through the wider use of radio, please, Mr. Q, let us train our non-rated pilots to stay out of weather rather than encourage them to kill themselves in it. Your men can help, too, by tracking down the violators and making their punishment certain.

Why not have the **best** when the cost is **less?**

Riley *Super Customized* 310R

The Riley Super-Customized 310R is unsurpassed in speed, quality, single-engine performance, high-speed range, visibility, economy, comfort and stability.

An enjoyable flight will prove these facts.

- *New 260-hp. Fuel-Injection Engines*
- *High Speed — 236 mph. Cruise*
- *Up to 1,400 Miles Range, 7-Hours Endurance*
- *New Free-Flo Underwing Exhaust System*
- *New Fuel Tanks Boost Capacity 40%*
- *Unparalleled Stability for Hands-Off Flying*
- *Improved Single-Engine Safety*
- *Engineered Soundproofiing*
- *Bond-Tight Skin Surface*
- *Hi-Gloss Custom Paint Design and Custom Interiors*
- *Custom Airline-T Instrument Panel*
- *One-Piece Windshield and Tinted Double Windows*

The 310R is Best by Far!

For further information write or call

Riley-Kelly Aircraft, Ltd.

BROWARD COUNTY AIRPORT • P. O. BOX 5019 • JAckson 3-7526 • FORT LAUDERDALE, FLORIDA

ADDISON AIRPORT

(Continued from page 29)

fic would increase so rapidly as to require this facility less than three years after opening. Last month a brand new TVOR was installed by the FAA to replace the original Addison Omni donated by Collins Radio and operated by the airport. The new Omni station operates on 111.4 mc. and is ready for DME installation.

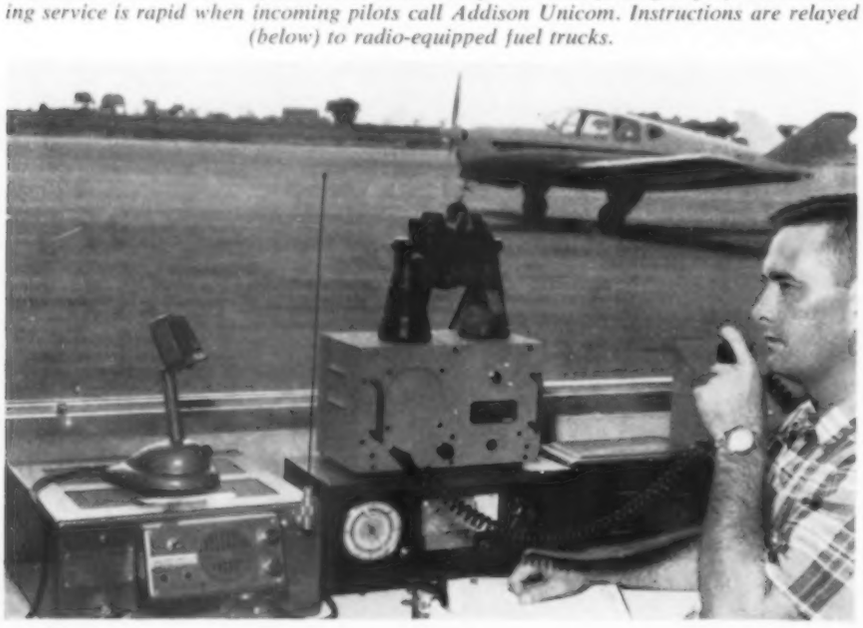
When all the land options are exercised there will be a total of 440 acres, including the industrial site development yet to come. Land valuations have gone up in the area since the airport was built and a recent appraiser said the land had doubled in value and was worth upwards of $3,250 per acre. No doubt the increase in land values around the small community of Addison is partially due to the airport whose tenants employ some 300 people on the field in addition to the 14 employees of the airport. The investors in the airport do not seem to be concerned with the fact that land values may continue to skyrocket and pass, if not already there, the point where use of such high-priced land as an airport is not economically justified. "Who determines whether an airport should be on cheap or expensive land?" Manager Stuart asked when queried about the trend toward plowing up private enterprise airports into housing and industrial developments when land values soar. Addison owners plan to cash in on increased land values but not at the expense of closing the airport for other uses.

The success formula at Addison has more to it than meets the eye. Perhaps no airport in the nation has had more planning behind it prior to turning the first shovel full of dirt. Investors in Addison studied the private airport situation even before site selection. They found that the alarming attrition in private fields was caused by one or more of several factors — not enough land, short term leases, improper or complete absence of zoning protection, short runways, no provision for increased taxation. In the case of Addison they have taken care of the taxation bug-a-boo with escalator clauses in all leases.

While the airport is zoned by the town of Addison, additional protection of the main SE-NW heavy duty runway of 4,500 feet by land ownership in the north 50-1 approach zone while the Cotton Belt Railroad extends for miles at the south and is zoned 40 to 1. The SW-NE Runway of 3,200 feet is zoned 20 to 1 for protection but is rarely used because of prevailing winds.

In addition to omni the airport has Unicom, radio-equipped gas trucks, radar approach control through Love Field radar, published instrument minimums of 400 feet and 1 mile, 24-hour service, rotating beacon, car rental, weather teletype and free transportation to nearby motels. Turbine fuel has been added to the all-octane fuel availability. Aero Commander, Beech, Cessna and Piper have sales and service agencies on the field.

Most of the 170 private planes based at Addison Airport use T-hangars and ramp attendants tow them to and from the terminal ramp where all fueling is performed. Fueling service is rapid when incoming pilots call Addison Unicom. Instructions are relayed (below) to radio-equipped fuel trucks.



GRISWOLD LATERALIZER

(Continued from page 27)

sign at Texas A & M College after World War II. He finally dropped the bellows-pendulum work completely after the Lear L-2 came out.

But the L-2 and even less costly lightplane autopilots since perfected have left unsolved the aerodynamic measurement approach to automatic stabilization. It appears that Roger Griswold has thus become the first experimenter to achieve success with the simplest and cheapest method of all.

Because the Griswold system utilizes aerodynamic measurements, it would appear to "belong" as a logical part of an airplane's rigging or primary control system just as the ailerons themselves are part of the control system. If an aircraft designer's objective is to achieve built-in stabilization to eliminate wing-dipping and spiralling tendencies, there could be no simpler method than to incorporate in the rigging a means for automatically and accurately restoring wingtip air pressure balance whenever it is disturbed. The pilot's control would easily override the system for intentional maneuvers but whenever pilot control is relaxed, the aileron control would automatically and accurately return to center, with wings level. Pilot relaxation would make for more comfort and less fatigue, more efficient navigation. Trapped atop the overcast or in failing visibility, the VFR pilot could trim for gradual descent and let go of the controls with the assurance that his wings would remain level for a letdown straight ahead without the threat of a deadly spiral.

Marketing plans are now being formulated by Griswold and he is expected to intensify his efforts with installation approvals in additional lightplane models.—T. A.

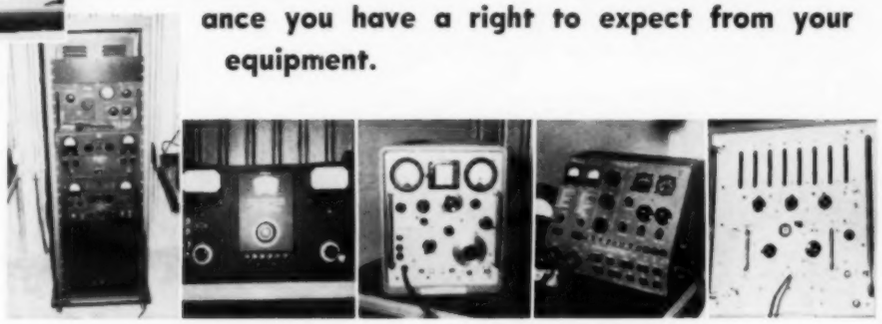
BROWN AERO MODERN TEST

EQUIPMENT ASSURES THE ULTIMATE IN ACCURACY

If you have been plagued by constant electronic problems we would like to suggest you consult with Brown Aero Corp for prompt trouble-shooting on all radio and automatic pilot installations to obtain the dependable performance you have a right to expect from your equipment.

Sales, Service and Installation

- ARC
- COLLINS
- DARE
- MOTOROLA
- NARCO



Skilled technical personnel under the capable supervision of veteran radio and electronic specialist BOB SAXON are prepared to solve all your communication problems.

Brown Aero Corp maintains one of the most extensive testing laboratories in the nation with special equipment for every purpose — Portable Omni Simulator and Omni Test Equipment — Low Frequency Signal Generator — VHF Signal Generator — Complete Automatic Pilot Test Equipment — Automatic Frequency Channel Checker.

We also design and fabricate instrument panels to conform to each pilot's specific requirements.

BROWN AERO CORP

ADDISON AIRPORT P. O. Box 8 ADDISON, TEXAS Telephone (Dallas, Texas): AD 9-2618

The finest product in the air deserves the finest service on the ground

. . . certified BEECHCRAFT Service

To obtain the best service for your Beechcraft and for prompt attention to maintenance and overhaul requirements, visit the Certified Beechcraft Service Stations listed.

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ATLANTIC AVIATION CORP.
- Teterboro Airport
  Teterboro, New Jersey
- Logan International Airport
  East Boston, Massachusetts
- International Airport
  Philadelphia, Pennsylvania
- New Castle County Airport
  Wilmington, Delaware

BUTLER CO., AVIATION DIVISION
Midway Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

GREENSBORO-HIGH POINT AIR SERVICE, INC.
Greensboro-High Point Airport
Greensboro, North Carolina

ELLIOTT FLYING SERVICE
- Municipal Airport, Des Moines, Iowa
- Municipal Airport, Davenport, Iowa

THE NORMAN LARSON CO.
PLANESERVICE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
(Los Angeles Area)

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
Winston-Salem, North Carolina

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

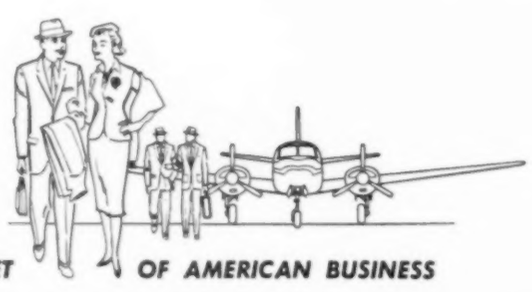
TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

UNITED AIRPLANE SALES, INC.
New Municipal Airport
Wichita, Kansas

Beechcraft



BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Now 19" longer than before! Inside, the new Beechcraft Travel Air has 15 cu. ft. more space for passengers and baggage than any twin in its class.

Another reason why you're ahead with a Travel Air . . .

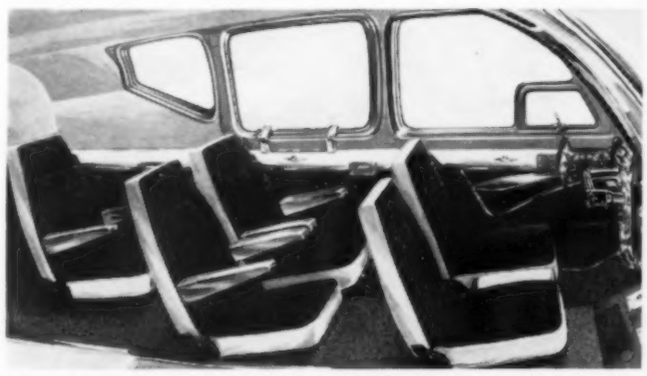
No Other 5-Place 200 mph Twin Comes So Close To Single-Engine Operating Costs:

Even at 200 mph, the Beechcraft Travel Air uses only a little more fuel than many single-engine business planes. And it costs even less—far less—to buy and to operate than many twin-engine business planes with which it may be compared. Lower fixed annual costs, including lower insurance rates, and lower direct operating costs add up to thousands of dollars in savings for the owner of a Beechcraft Travel Air.

A challenge to fly? Not at all. In fact, the Travel Air is so simple and easy to fly that many new pilots have actually learned to fly in it! And multi-engine pilots who have flown it love it. Want more facts? Sure . . .

- **Lowest fuel and oil costs**—you can get up to 11 miles from each gallon of gasoline.
- **Extra-long range**—you can fly more than 1,200 miles and still have a fuel reserve.
- **Single-engine maintenance costs** — both 180 hp Lycomings can be overhauled at Beech service stations for about the cost of overhauling just one 260 hp engine.
- **Quietest twin in the sky**—even at 200 mph, you converse easily and cruise relaxed in "Quiet Sealed" comfort unmatched by any twin.
- **Big "flight planned" instrument panel** with room to put a wide range of the newest radio and instrument equipment within easy reach.

See and fly the new Travel Air at your Beechcraft distributor's or dealer's. And, for illustrated Beechcraft brochures, plus details of low-cost Beech financing plans, write Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.



New 5-seat interior with individually reclining chairs has plenty of head room, hip room and leg room—even for five 6-footers—plus big baggage area. All interiors custom finished in rich fabrics and leather trim in your choice of colors.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Close-up shows 4-lb., 6-in.-square ACF pictorial navigation display unit. Freely-moving "bug" (dot in circle top right of center) is positioned by continuous bearing-distance information from VOR-DME station (center), following aircraft's ground track on transparent Jeppesen map. Unit was designed for business and commercial aircraft.

VOR-DME Pictorial Navigation

DESIGNED especially for commercial and business aircraft, a new compact, self-contained and lightweight pictorial navigation display features a moving "bug" under a transparent map to trace the aircraft's position at all times for simplified and precision navigation regardless of visibility.

It was developed and will be marketed by the electronics division of ACF Industries, Inc. Operation of the freely-moving "bug" is provided by bearing and distance information from VOR-DME ground stations, the constantly-changing information positioning the "bug" under the transparent map in synchronization with the ground track of the aircraft.

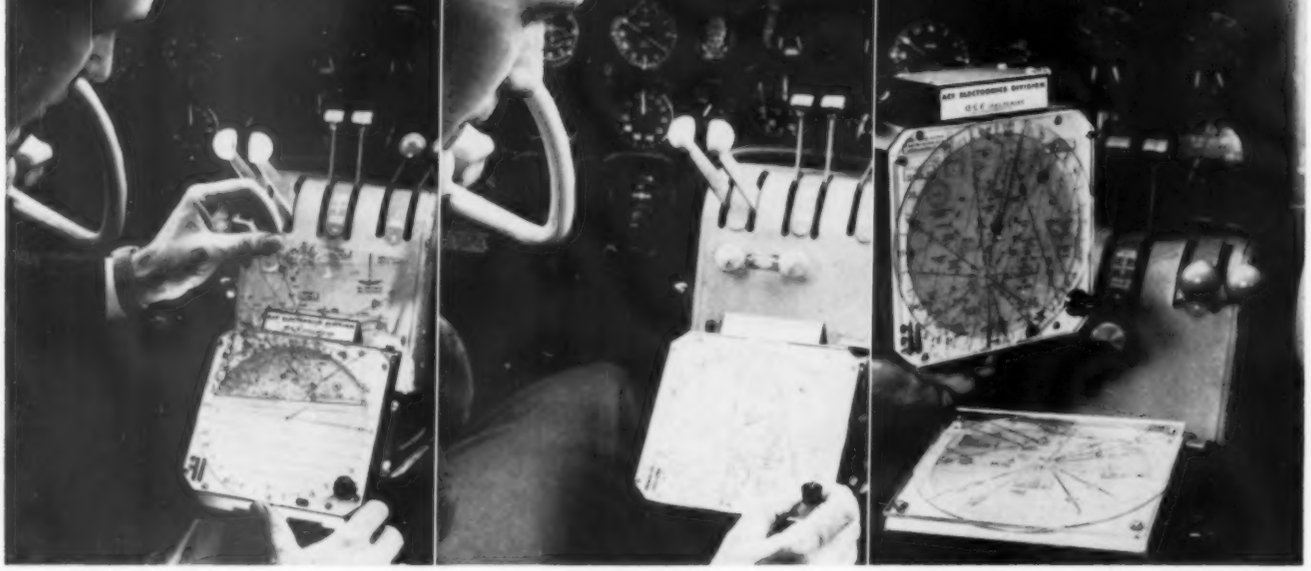
The smallest effective navigation display ever produced, the ACF unit is 6 ins. square and either 3.5 or 2 ins. deep, depending on whether a roll-map or a slide-map version is used. Weight is 5 and 4 lbs., respectively. Maps printed on transparent Mylar are available in any scale although 10, 20 and 48 nautical miles to the inch are expected to become the standards. The RT-1 version uses a continuous-roll map of approximately 80 frames and the RT-1B uses individual map slides readily inserted by hand. Use of transparent maps and lucite covers, plus luminescence of the orange-colored "bug," provides maximum day-and-night visibility, with back-lighting in white or red light for night use. Jeppesen of Denver supplies the maps, edited especially for the unit.

About 800 map slides cover the U. S., one for each of about 600 VOR-DME ground stations and others for different scale-maps for key areas. Terminal area maps generally use 10-mile-ince scale; en route maps use 48-mile-inch scale.

G. B. Shaw, general manager of

(Continued on page 48)

Photos below show new ACF pictorial navigation display in Aero Commander. At left, pilot inserts a transparent map slide. He is shown at center adjusting control to newly-inserted map. At right, slide unit (in hand) is shown with map-roll unit, which uses continuous 80-frame roll map.



Raymond Umbaugh recently released this photo showing U-18 autogyro components on a well-swept factory floor at Fairchild Aircraft in Hagerstown, Maryland. Fairchild, he says, will build 10,000 U-18's for Umbaugh Aircraft of Ocala, Florida.

Umbaugh's Promise

WHEN will Raymond E. Umbaugh begin delivering the attractive-looking little 2-seater autogyro he has long promised to enthusiastic franchise holders? No specific date has been set. But Umbaugh Aircraft Corp. of Ocala, Florida, recently released photographs showing components for a couple of Umbaugh 18's on the factory floor at Fairchild Aircraft in Hagerstown, Maryland.

"Hard tool proof testing was carried out through five prototypes of the production model; the prototypes are also being utilized to speed up certification and for demonstration work," says Umbaugh, adding that Fairchild had subcontracted "to manufacture 10,000 Umbaugh 18's" and "mass production begins soon."

These and other claims by Umbaugh have created wide interest in the small autogyro but continuing delays in finalizing and actually delivering the aircraft have also created skepticism and doubts about the project. Umbaugh, a 39-year-old former flight instructor, is considered unrealistic in promising to (1) manufacture 10,000 autogyros and (2) deliver them for $9,995 — he would have to out-perform the entire lightplane industry and all of its sales outlets combined to do either and this is unlikely soon, to say the least. Umbaugh's answer is that deposits have been made on 6,000 U-18's.

The U-18 is described by Umbaugh as having a 180-hp. Lycoming engine driving a pusher propeller, giving it a power loading of 10 lbs. per horsepower at a gross weight of 1,800 lbs. Its high-energy rotor is free-wheeling except for jump take-off. In flight, the free-wheeling rotor is dependent on forward or downward momentum, all thrust being provided by the pusher propeller. Autogyros were used on a very small scale before World War II, after which helicopters took over the rotary-wing field with constantly-increasing success even though they are more complex and their costs are therefore considerably greater.

Umbaugh's U-18 claims include 585-lb. useful load, 1,050-fpm. rate of climb, 100-mph. cruising speed on 65% of power and 15,000-ft. service ceiling. His main selling points, however, are said to be simple piloting requirements, "backyard" take-offs and landings, and freedom from stalls and spins.

Chief engineer of Umbaugh Aircraft is Gilbert DeVore, formerly flight test engineer for CAA in development of test procedures for heli-

(Continued on page 47)

Two-place U-18 has 180-hp. Lycoming driving pusher propeller. Free-wheeling rotary wing depends on forward or downward momentum except for jump take-off, when it is partially engaged to the engine. It is said to have a 585-lb. useful load at an 1,800-lb. gross weight.

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant.
Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

FOR THE BEST IN PIPER SERVICE AND MAINTENANCE VISIT THE PIPER FACTORY-CERTIFIED SERVICE CENTERS LISTED BELOW

ANDERSON AVIATION CO., INC.
Sky Harbor Airport
P. O. Box 5175
BRidge 5-5741
Phoenix, Arizona

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmestead 5-1728
Austin, Texas

CATLIN AVIATION CO.
Will Rogers Field
P. O. Box 2398
MUtual 5-6644
Oklahoma City, Oklahoma

CUMMINGS & GROVES AVIATION, INC.
Houston International Airport, Hangar No. 8
MIssion 4-5593 *and OLive* 4-4351
Houston, Texas

DELAWARE AVIATION CORPORATION
North Philadelphia Airport
HObart 4-1600, *TWX PH* 520
Philadelphia 36, Pennsylvania

DES MOINES FLYING SERVICE, INC.
Howard Gregory, President
Municipal Airport
ATlantic 8-2218
Des Moines, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

ROSS AVIATION, INC.
Riverside Airport
HIckory 6-6654
Tulsa, Oklahoma

WEB THOMAS AIRCRAFT, INC.
Highland Park and Addison Airports
ADams 9-2687
Dallas, Texas

NOW!

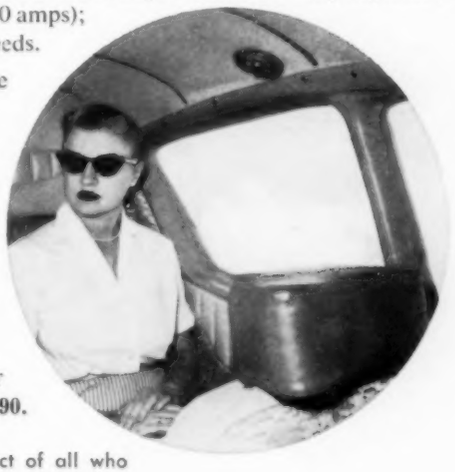
Apache MODEL G

NOW... Piper presents the Apache G, newest, finest version of the world's most popular executive twin, with great new cabin comfort features including two new picture windows, beautiful new styling and decor, new improved cabin air system.

Other new improvements, too. New, easier nose wheel steering and lighter in-flight rudder loads; new, improved, more finely adjustable high-heat carburetor system; higher generator capacity (50 amps); higher permissible gear-down (150 mph) and flap-down (125 mph) speeds.

And inherent in the Apache G is the most important feature you want in any airplane... *dependability*. Dependability of components... dependability of systems... dependability of power plants... dependability that's the net result of design refinement and improvement dictated by millions and millions of hours of operation world-wide... dependability that's been proved out in well over 100 trans-Atlantic and trans-Pacific ferry flights.

The Apache G gives you the most economical twin-engine transportation, too, with lowest direct operating expense plus lower insurance cost, lower depreciation because it's priced far lower than any other twin... **still only $36,990.**



BEST SEAT IN THE HOUSE! That's the verdict of all who have flown in the Apache G's fifth seat with new rear window on each side. Greatly improves pilot's rearward visibility, too. Just one of many new features in the latest Apache G.

For full details on the new Apache G see your Piper dealer or write for Apache G catalog, Dept. 8-F.

ATTRACTIVE LEASE AND FINANCE PLANS

PIPER AIRCRAFT CORPORATION
Lock Haven, Pennsylvania

Pledge
OFFERED EXCLUSIVELY BY
Verified
Aircraft
Value
BEECHCRAFT DISTRIBUTORS & DEALERS
This emblem on a used plane is your assurance of a top-value airplane, whatever its make or model. Don't guess—be sure! Get a VAV airplane.

How To Take The Guesswork Out Of Buying A Used Plane:

How good are you at evaluating a used plane? If you aren't an expert, it will pay you to have the airplane you are considering thoroughly checked by an expert who can tell you its true condition before you buy.

The VAV certificate on any used plane means that the airplane has already been checked by experts. And on the back of the VAV certificate you'll find a complete evaluation report.

Only hand-picked top trade-ins are considered for VAV certification. But each of these is then given a complete inspection to make sure that all manufacturer's recommended modifications have been made and that all FAA Bulletins have been complied with. If any non-compliances are discovered, you are told about it before you buy. Think what this service is worth to you!

So why just guess—when you can be sure? See your Beechcraft distributor or dealer. Find out how little it really costs to own a VAV plane — the best value, dollar for dollar, that your money can buy. Low-cost financing available.

See These Beechcraft Distributors* and Dealers for VAV Aircraft

ALABAMA
- **Birmingham**—*Southern Airways Co.
- **Montgomery**—Montgomery Aviation Corp.

ALASKA
- **Anchorage**—Sea Airmotive, Inc.

ARIZONA
- **Phoenix**—*Cutter Aviation, Inc.

ARKANSAS
- **Ft. Smith**—Ft. Smith Flying Service, Inc.
- **Little Rock**—Central Flying Service

CALIFORNIA
- **Bakersfield**—Alpha Aircraft
- **Fresno**—Aero Sales & Service, Inc.
- **Oakland**—*Golden Gate Aviation, Inc.
- **San Bernardino**—Tri-City Airport
- **San Leandro**—Evergreen Aircraft Sales
- **Santa Ana**—Martin School of Aviation, Inc.
- **Santa Monica**—Wade Air Service
- **Santee**—Mission Aviation, Inc.
- **Van Nuys**—*Norman Larson Co.

COLORADO
- **Denver**—*Combs Aircraft, Inc.

CONNECTICUT
- **Rocky Hill**—*Atlantic Aviation Corp.
- **South Meriden**—Meriden Aircraft Corp.

DELAWARE
- **Wilmington**—*Atlantic Aviation Corp.

FLORIDA
- **Jacksonville**—Ren-Lin Aviation, Inc.
- **Lantana**—Florida Airmotive, Inc.
- **Miami**—Tursair Executive Aircraft Services, Inc.
- **Orlando**—*Southern Airways of Florida, Inc.
- **St. Petersburg**—Pinellas Aircraft, Inc.
- **Tampa**—*Southern Airways of Florida, Inc.

GEORGIA
- **Albany**—Albany Air Service
- **Atlanta**—*Southern Airways Co.

ILLINOIS
- **Chicago**—*Butler Airplane Sales
- **Lockport**—Star-Line Aviation, Inc.
- **Mt. Vernon**—Outland Aviation Co.
- **Rockford**—*Butler Airplane Sales
- **Springfield**—Capitol Aviation

INDIANA
- **Bloomington**—Indiana Aviation Activities, Inc.
- **Elkhart**—Hanley Air Activities, Inc.
- **Evansville**—Crescent City Aviation
- **Fort Wayne**—George H. Bailey Co., Inc.
- **Indianapolis**—*Roscoe Turner Aeronautical Corp.
- **Terre Haute**—Hulman Field Aviation, Inc.
- **Valparaiso**—Valparaiso Aero Service, Inc.

IOWA
- **Cedar Rapids**—Wathan Flying Service
- **Davenport**—*Elliott Flying Service, Inc.
- **Des Moines**—*Elliott Flying Service

KANSAS
- **Garden City**—Western Planesales, Inc.
- **Kansas City, Kansas**—*Topeka Aircraft Sales & Serv., Inc.
- **Topeka**—*Topeka Aircraft Sales & Serv., Inc.
- **Wichita**—*United Airplane Sales, Inc.

KENTUCKY
- **Lexington**—*Blue Grass Airmotive, Inc.
- **Louisville**—*Blue Grass Airmotive, Inc.
- **Owensboro**—Owensboro Aviation Co.

LOUISIANA
- **Baton Rouge**—Baton Rouge Aircraft, Inc.
- **Shreveport**—*Currey Sanders Aircraft Co., Inc.

MARYLAND
- **Baltimore**—Pan-Maryland Airways, Inc.
- **Silver Spring**—Atlantic Aviation Service, Inc.

MASSACHUSETTS
- **East Boston**—*Atlantic Aviation Corp.

MICHIGAN
- **Grand Rapids**—Grand Rapids Aviation, Inc.
- **Iron Mountain**—Fontana Aviation, Inc.

Lansing—*Francis Aviation
Muskegon—Executive Air Transport
Ypsilanti—Air-O-Fleet Corp.

MINNESOTA
Mankato—Dean Brown
Rochester—*Gopher Aviation, Inc.
South St. Paul—*Gopher Aviation Sales
Worthington—Worthington Air Service

MISSISSIPPI
Jackson—Jim Hankins Air Service

MISSOURI
Kansas City—*Topeka Aircraft Sales & Service, Inc.
St. Louis—*Young Aviation Corp.
Valley Park—Midwest Aircraft Sales Corp.

MONTANA
Billings—Montana Aircraft Co.

NEBRASKA
Omaha—*Robert Graf, Inc.

NEVADA
Las Vegas—Aero Vegas, Inc.

NEW JERSEY
Teterboro—*Atlantic Aviation Corp.

NEW MEXICO
Albuquerque—*Cutter-Carr Flying Service

NEW YORK
Mattydale—*Syracuse Aircraft Sales, Inc.
New York (Teterboro, N. J.)—*Atlantic Aviation Corp.
Rochester—*Page Airways, Inc.

NORTH CAROLINA
Charlotte—*Southern Airways Co.
Greensboro—Greensboro-High-Point Air Service, Inc.
Winston-Salem—*Piedmont Aviation, Inc.

NORTH DAKOTA
Omaha—Robert Graf, Inc.

OHIO
Cleveland—Donges Aircraft Sales, Inc.
Columbus—Columbus Aviation, Inc.
Findlay—Eddy Flying Service, Inc.
Vandalia—*Ohio Aviation Co.
Youngstown—*Youngstown Airways, Inc.

OKLAHOMA
Muskogee—Sam's Flying Service
Oklahoma City—*Aircraftsmen, Inc.
Tulsa—*Tulsair Distributors, Inc.

OREGON
Portland—*Flightcraft, Inc.

PENNSYLVANIA
Dravosburg—Beckett Aviation Corp.
Erie—Derion Aviation
Philadelphia—*Atlantic Aviation Service, Inc.
Washington—Tri-State Aviation

RHODE ISLAND
Hillsgrove—Lippitt Aviation, Inc.

SOUTH CAROLINA
Charleston—*Hawthorne Aero Sales

SOUTH DAKOTA
Rapid City—Snedigar Flying Service

TENNESSEE
Chattanooga—ExecAir, Inc.
Knoxville—East Tennessee Aircraft, Inc.
Memphis—*SouthAire, Inc.
Nashville—*Blue Grass Airmotive, Inc.

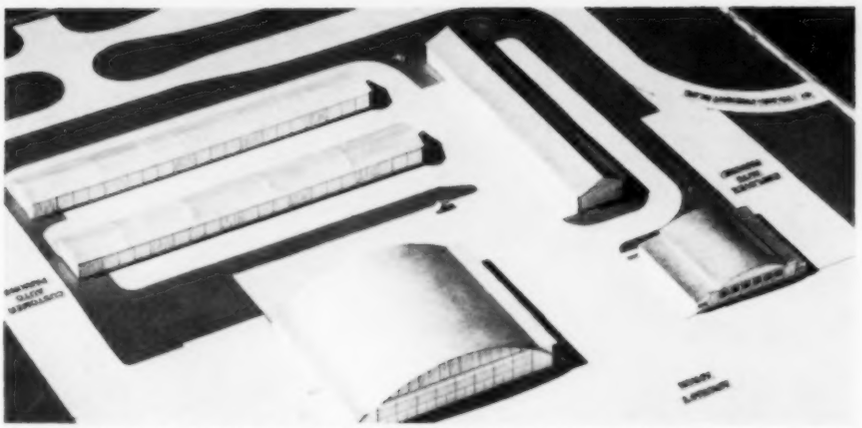
TEXAS
Abilene—Abilene Aviation Co.
Amarillo—*Tradewind Airport Corp.
Corpus Christi—Gulf Coast Aviation, Inc.
Dallas—*J. R. Gray Co., Inc.
Texair, Inc.
El Paso—Westside Airport
Fort Worth—Ritchey Flying Service
Houston—*Business Aircraft, Inc.
Midland—Rich Air Co.
Plainview—Claude Hutcherson
San Antonio—*Alamo Aviation, Inc.
Tyler—Texas Aviation Corp.

UTAH
Salt Lake City—*Utah-Idaho Aircraft Co.

VIRGINIA
Lynchburg—Atlantic Aviation, Inc.
Norfolk—*Piedmont Aviation, Inc.

WASHINGTON
Seattle—Sulak Aviation Sales & Service
Spokane—Western Aircraft Corp.

WISCONSIN
Madison—Wiscon-Air, Inc.
Milwaukee—*Butler Airplane Sales



NEW PRIVATE AIRCRAFT TERMINAL IN THE NORTHWEST is being erected at International Airport, Portland, Oregon, by Flightcraft, Inc., Beechcraft distributor for Oregon, Washington, Northern Idaho and Alaska. Silas King and Chuck Miller of Flightcraft said the new facility, a model of which is shown above, will cost about $350,000 and include a 180 by 120-ft. service hangar with shop and office space, two 10-unit T hangars for light twins single-engine aircraft, one 6-unit T hangar for heavier twins, a 100 by 80-ft. service hangar and modern pilots' lounge and waiting room for passengers. On a 5-acre ramp, it will be completed by November.

UMBAUGH'S PROMISE

(Continued from page 43)

copters, design engineer and chief of flight test for Fairchild Personal Planes Division, NACA engineer in flight research, project engineer for Bristol Aircraft Division of Universal Moulded Products, and experimental design engineer for Curtiss-Wright. He is 41.

Umbaugh himself was a flight instructor in World War II. After the war, he is said to have made a fortune with a team of flying salesmen marketing chemical fertilizers custom blended for farmers. He rented helicopters for farm-to-farm solicitation in this work and their versatility and high costs inspired him to undertake the autogyro development.

★ ★ ★

ATLANTIC AVIATION'S expanded and modernized facility at Lynchburg, Virginia, was opened recently with showing of new Beechcraft models and a barbecued pig feast for some 250 guests. Part of Lynchburg's 3-phase airport expansion (modern new terminal is nearing completion), Atlantic Aviation's compact facility includes air-conditioned office, three hangars, a large ramp and a golf putting green.

have you ever wished for

AN EXTRA PAIR OF HANDS?

When you are trying to tune a receiver, establish voice contact with a VOR station, unfold a chart, adjust power settings, and fly the airplane, all at the same time — that's when you need an extra pair of arms — or a Mitchell Automatic Pilot. Small and compact, the transistorized Mitchell is always ready to take the controls, leaving you free to devote your full attention to navigation, radio procedures, and traffic. With an 8-pound Mitchell installed in your aircraft, you can turn to and hold any heading and establish precision climbs or let-downs . . . completely "hands off." Mitchell systems range in price from 2-control CO-PILOT system at $1095 to the 3-control COMMANDER with automatic heading and altitude selectors at $3245 (slightly higher for 28-volt systems).

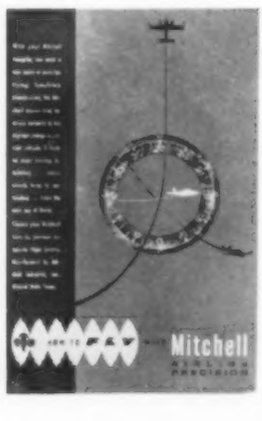
This new Mitchell Flight Manual is now available from your Mitchell dealer. Besides describing all six basic Mitchell autopilot systems, the new manual also tells how to fly the autopilot and explains how a Mitchell simplifies both IFR procedures and normal VFR flying. To get your free copy of this useful manual, write today to Mitchell Sales Agency. Request Flight Manual 60-2.

AUTHORIZED NATIONAL SALES AGENCIES

Address inquiries to: Mitchell Sales Agency, Dept. 62, Box 1181, Fort Worth, Texas

GASCO, INC.
Vandalia, Ohio
AVIATION SUPPLY CORP.
Tampa, Florida; Atlanta, Georgia
THE DON HORN COMPANY
Memphis, Tennessee
GENERAL AIRCRAFT SUPPLY CORP.
Detroit, Michigan; Berea (Cleveland), Ohio
Philadelphia, Pennsylvania
GENERAL AVIATION SUPPLY COMPANY
St. Louis, Missouri; Oklahoma City, Oklahoma
Dallas and Houston, Texas; Phoenix, Arizona

Manufactured by MITCHELL INDUSTRIES, INC., Mineral Wells, Texas



PICTORIAL NAVIGATION

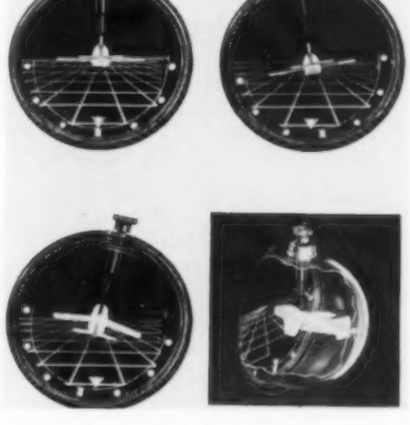
(Continued from page 42)

ACF Electronics, said the display unit is easily adaptable to any cockpit configuration. He said the display unit will prove to be an important contribution to the solution of growing air traffic problems, both in terminal areas and en route — it simplifies navigation and lessens the communications workload both for the pilot and Air Traffic Control. "Tests show communications between pilot and controllers can be reduced by nearly one-third when all aircraft are equipped with pictorial displays," Shaw said. "Pilots can fly off-course, circular routes and holding patterns over any point. Flying of straight VOR radials can be eliminated. Since ATC will need only to monitor the flight and not provide specific instructions to the pilot, ATC can clear the plane in and out of airports faster, without costly stacking and holding delays."

He said use of the navigation display can make possible parallel flight tracks between cities in high-density areas. For example, rather than fly all aircraft over identical check points between New York and Washington, it should be possible to set up any number of tracks or lanes between the cities and pilots could follow the ACF "bug" along predetermined tracks, outlined on their drop-in maps, with complete safety over direct routes.

★ ★ ★

NEW MODEL 3-D GYRO HORIZON was introduced recently at the Reading Air Show by Coffing Industries of Covington, Ind. Pilot literally sees his plane fly in an accurate 3-dimensional presentation of miniature plane and simplified grid pattern representing horizon and ground. In photos below, plane is flying straight and level (left) and banking in descending turn. Climbing turn is pictured at lower left, while side view shows 3-D mounting of plane and horizon. Pointer at base of instrument shows degree of bank.



AUTHORIZED
Cessna
SERVICE

The Cessna dealer displaying the factory authorized service sign represents a symbol for friendliness, hospitality and expert Cessna service featuring

factory-trained mechanics . . .

factory-approved equipment . . .

and a complete stock of genuine factory parts.

Make the most of your Cessna's usefulness by depending on the Authorized Cessna Service Centers listed for assurance that your airplane is always ready to go, always in top condition for reliability, performance and comfort.

Your Cessna is always ready to go

when you depend on the factory authorized Cessna Service Centers listed below.

Aircraft Sales Company
Gregg County Airport
Longview, Texas
Meacham Field
Fort Worth, Texas

Airflite, Inc.
3353 Lakewood Boulevard
Long Beach 8, Calif.

Airnews, Inc.
260 E. Terminal Drive
San Antonio, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Coastal Aviation, Inc.
4906 Tampa Bay Blvd.
Tampa International Airport
Tampa 3, Florida

Cruse Aviation, Inc.
International Airport
Houston, Texas

Executive Aircaft Company
701 Perimeter Road
Kansas City, Missouri

Lynch Flying Service, Inc.
Logan Field Box 1575
Billings, Montana

Macon Air Service, Inc.
P. O. Box 2036
Macon, Ga.

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Kenneth Starnes Aviation Service
Adams Field
Little Rock, Arkansas

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Wings, Inc.
Wings Field
Philadelphia 18, Pa.

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

THREE NEW BEECHCRAFT TRAVEL AIR TWINS were delivered recently to North American Aviation at Los Angeles, which will use them in its 7-plane fleet in flying some 2,400 passengers monthly between production and test facilities of the big aircraft-missile manufacturer. Left to right are Don Nemec, Ray Niles and Bud Poage, North American pilots, and Rod Rodriguez of the Norman Larson Co., Beech distributor who made the sale.

—(Beech Aircraft Photo.)

when you're caught in weather

COFFING

3-D HORIZON

helps you control attitude with VFR ease!

You fly behind a miniature 3-dimensional plane in your 3-D Gyro Horizon that continuously duplicates your aircraft's position against a simplified grid-type horizon. You see, in a natural way, every change in pitch and roll. What's more, the realistic 3-dimensional presentation minimizes the chance of vertigo under IFR conditions.

NATURAL VFR PRESENTATION — repeated tests show that pilots can expect to make safe 180° turns and meet new FAA instrument proficiency requirements with an hour's orientation.

VFR — Gives added assurance on X-C against inadvertent weather conditions. Confidence-building because you rely on your normal flight reflexes.

IFR — Makes weather and "on top" flying easier by eliminating need for split-second attitude computations.

GYRO HORIZON Vacuum-Type Exchange . . . lets you own your Coffing 3-D Gyro Horizon at a modest cost. **Exchange Price** $320.00 . . . Write for exchange details.

Write for demonstration flight

COFFING INDUSTRIES, INCORPORATED

Aircraft Instruments and Systems Division

COVINGTON, INDIANA • Sycamore 3-3462

AIR REPORT

(Continued from page 12)

operations, having the highest "in-commission" rate of any Air Force aircraft.

ELECTRIC AUTOLITE has been negotiating a merger agreement with Hiller Aircraft. The helicopter manufacturing company's operations would be augmented by Autolite's new Aero-Space Division and Autolite's special Products and Research Division. Stanley Hiller expects Autolite's financial strength to benefit Hiller's helicopter developments.

DELIVERIES OF PIPER AZTEC TWINS to the U. S. Navy were to begin in August after 10 Navy pilots and 35 Navy maintenance specialists were trained at the Piper Aircraft plant. Each pilot received 4 hours of check-out time. The personnel were from seven Naval Air Stations — Alameda, Anacostia, Jacksonville, Johnsville, Norfolk, San Diego and Pensacola.

NEW TACTAIR GOLD SEAL T-3 automatic flight system is covered by a full-year warranty under which any parts or components of the pneumatic system, including directional gyro and artificial horizon, will be serviced or replaced free of charge for a 12-month period following installation.

NEW KING RADIO SALES MANAGER is William E. Kelley, formerly of Grit Printing, Wichita. . . . **CHARLEY JONES,** sales specialist for the Sierracin Corp., has resigned to become director of airports of Riverside County, California.

POWDER PUFF DERBY WINNERS of the All Woman Transcontinental Air Race from Torrance, Calif., to Wilmington, Del., June 9-13, were: (1) Aileon Saunders, El Cajon, Calif., and June Douglas, Fall River, Mass., in a Cessna 172 with average ground speed of 118.15 mph. against handicapped speed of 103 mph. sponsored by Travelodge Corp., San Diego; (2) Frances Miller, Columbia, S. C., Piper PA-24 180 hp. Comanche, averaging 146.76 mph. against 133-mph. handicap, sponsored by Aircraft Sales & Service, Columbia, S. C., and (3) Lucille Quamby, Detroit, and Mrs. B. Steadman, Flint, Mich., Cessna 172, averaging 114.74 against 103-mph. handicap, sponsored by Brunswick Corp., Chicago.

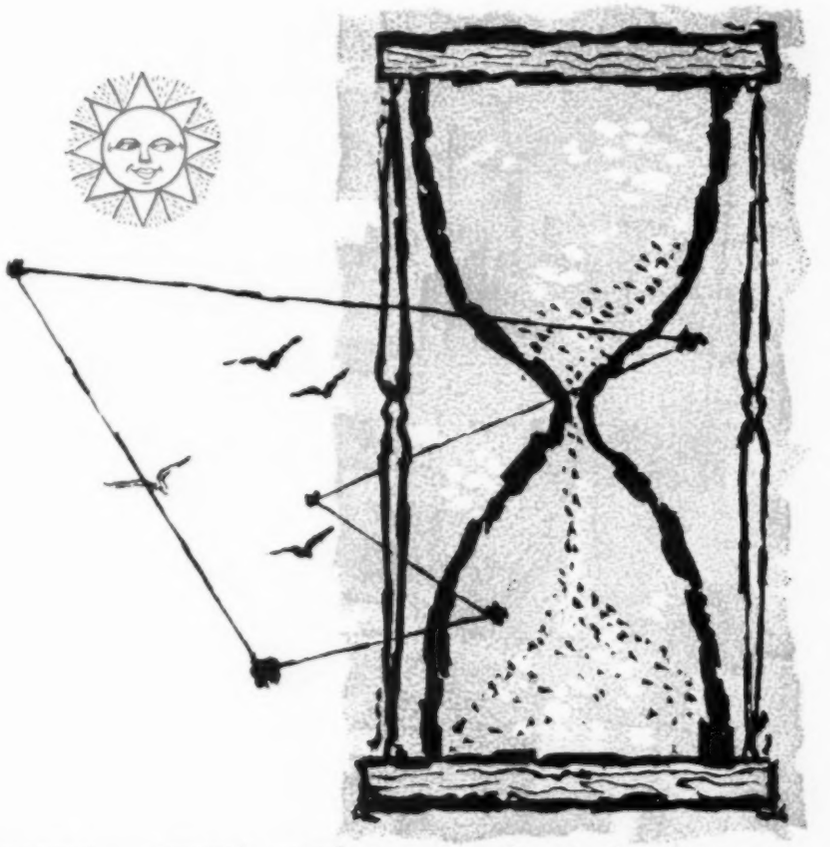
New Business In The Hangar

THE AIRWORK OPERATIONS SYMPOSIUM at Millville, N. J., Sept. 8-9, is expected to draw record attendance. Among forum matters already announced are "business management for business pilots" and "low-tension ignition for flat engines." The latter will be discussed by a Bendix expert who will display a Bendix low-tension ignition system for flat engines. Low-tension ignition has been proved advantageous on large radial engines used by the airlines. Regarding business management for business flying, Airwork is scheduling discussion leaders whose training qualifies them to discuss increasing demands on corporate flying executive pilots. Corporate aviation now represents major capital expenditures and aviation departments in many firms have as great an investment in equipment as some of the operating divisions. Executive pilots are increasingly expected to possess executive ability extending into tax matters, scheduling and capitalization ratios. Motel reservation information for the symposium may be obtained from Charles Sisco, Airwork Corp., Millville, N. J.

AERO CORPORATION OF ATLANTA, Municipal Airport, Atlanta, performed x-ray inspections on A. A. Joyces' National Life Insurance B-50 Twin-Bonanza and S. D. Jarvis Company's Grumman F8F-1. . . . No. 1 checks were made on a Trans-Alaskan Airlines DC-4 and an Associated Air Transport C-46. . . . Airline checks were also performed on an Associated C-54 and an Arctic Pacific C-46. . . . W. A. Miller, Jr., brought in his Mississippi Power and Light Beech 18 for double engine change and 1,000-hr. check. . . . Also in the hangar were W. T. Williams' Northern Electric Beech E18, a Zantop C-46, S. Germick's Texaco Convair and a Le Tourneau-Westinghouse Douglas B-23, Ernest Valdes, pilot.

INTER-AMERICA AVIATION MODIFICATION CENTER, Meacham Field, Ft. Worth, has had a steady flow of Grumman Gulfstreams in for Horton & Horton custom interiors, most recent deliveries being Gulfstreams for Eastman Kodak of Rochester, American Can No. 1 of New York and American Can No. 2 of Oshkosh. . . . First custom interior for a Lockheed JetStar will be installed by Horton & Horton in Continental Can's Lockheed, which will be the first JetStar to be delivered. It is due in during January. For its interior, General Lucius Clay has selected an "over-the-desert" color scheme. . . . de Havilland Aircraft's new Custom 800 Dove demonstrator was completed in July, receiving modifications, electronics, exterior paint and H-H custom interior in turquoise and limed white. Bulkheads are finished in easy-to-clean plastic-laminated drapery fabric and unusual features include miniaturized airline-type electric coffee service and heated lavatory wash water. . . . Executive helicopters receiving custom interiors included Bell's turbine-powered HU-1A, which has a 10-place interior. . . . A. E. Burgess of Birmingham took delivery of his D-18 with double engine change, 1,000-hour inspection, pitot modification, Grimes' rotating beacon, stair door, new exterior paint and 7-place custom interior. . . . Lloyd Patton's Dove received exterior paint and modifications. . . . The Schlumberger Dove was in for special seats. . . . Maintenance and inspection were performed for Ft. Worth Pipe's DC-3.

REMMERT-WERNER, Lambert Field, St. Louis, delivered a newly converted executive CA18 Convair,



TIME FLIES, TOO

With the pressures of business and tight flying schedules it becomes increasingly important to remember that TIME FLIES, TOO! Your flying equipment must get regular 100 hour and annual inspection prescribed for safety and efficiency. To do this job best it will pay you to let us schedule this regular service at Dallas Areo Service. Adequate facilities and experience here make DAS Service truly outstanding.

DALLAS AERO SERVICE

W. F. LONG, President

3300 LOVE FIELD DRIVE • PHONE FL 2-2641 • DALLAS 35, TEXAS

COMPLETE ONE-STOP SERVICE ON CONVENIENT LOVE FIELD

equipped with Sperry autopilot, Bendix radar, Collins dual omni and RMI and rear entrance door. Pilots are Hank Haddock and Bud Willett. . . . Tom Davis and John Kolar brought in the Pickands-Mather DC-3 for new paint, new instrument panel, lightweight landing gear doors, radar scope and interior rework. . . . A Sierracote heated windshield was installed in Neil Fulton's Olin Mathieson DC-3. . . . Lightweight landing gear doors were installed on the Bankers Life DC-3. . . . Walter Tschida's D. W. Onan & Sons DC-3 was in for two fresh Engine Works Super-92 engines and overhauled props. . . . Dean Sackman's Gardner-Denver Twin Beech had an RCA AVQ radar and ARC-21A ADF installed. . . . At Remmert-Werner's Pompano Beach facility, lightweight Goodrich de-icer boots were installed on John Constantine's Celco Aero Commander and one of Dick McNally's Freeport Sulphur DC-3's was at Pompano for overhaul of landing gear, hydraulic system and Janitrol heater, along with repainting and other work. . . . Harry Dawson took his Rockwell Standard DC-3 to Remmert-Werner's Toledo facility for a new interior.

PACIFIC AIRMOTIVE CORPORATION'S Burbank Aircraft Division delivered W. M. Keck, Jr.'s Grumman Gulfstream after installing complete custom interior, cockpit and cabin instrument panels, Nesi glass wiring, Pyrotector smoke and flame detection, paint and performance of service bulletins, with custom radio, radar and autopilot installed in conjunction with Qualitron. Pilots are T. J. Mayson and Miller Yoder. . . . E. C. Spencer took delivery of Murray Corporation's Fairchild F-27 after installation of custom interior, oxygen system, pressurization system, autopilot and wet wings, with custom radio and radio installed in conjunction with Qualitron. . . . Jack Bolick took delivery of Chesapeake & Ohio Railroad's Convair 240 with custom interior, heater, engine and propeller overhaul, instrument panel modification and inspection. . . . Hume Earnest was company representative with B. F. Goodrich's Lodestar when it was in for inspection, installation of PacAero Learstar radome and airspeed systems, new instrument panel, 200-amp generator system, wet wings and fuel dump system, removal of flare system and other work. . . . L. C. Weiland's Mellon Bank Lodestar was in for Sierracin electrically-heated windshield, PacAero alternate fuel metering source, fuel flow indicators and other items. . . . Toyo Menka Kaisha, Ltd., accepted Tokyo delivery of two Grumman Mallards and a Twin-Bonanza from PAC. They were inspected, ferry fuel systems were installed and then flown to Tokyo via the Pacific by Skyways Aircraft Ferrying Service. . . . Doyle Grout brought in R. L. Manning's Beech E-18 for repair of major damages

COMPARE

Service

You can look to Associated Radio for the kind of fast, excellent service you would expect from an organization who handles only leading brands of communication and electronic equipment.

Our unconditional one-year guarantee on all installations is possible because of our highly trained personnel who know no compromise with quality.

Associated can often provide "loaners" to keep you in the air while your equipment is being serviced, affording you just one of the unique extra services that makes Associated Radio a leader in aircraft electronics.

Let's get associated!

ASSOCIATED RADIO LOVE FIELD DALLAS CUSTOM SERVICE

Associated Radio

SERVICE COMPANY

Phone FLeetwood 7-6521

FAA Approved Repair Station No. 3664

3508 Love Field Drive *Dallas 35, Texas*

WAITING ON THE BOSS is not so easy at some airports in the hot country but Bob O'Hare, pilot for Texas Eastern Transmission Corp., of Houston, has a solution. He carries a folding cot and relaxes in the shade of his Twin Beech wing. O'Hare was photographed by Pat Gossett, Southwest Airmotive's camera girl, in a quick demonstration outside SAC's plush air-conditioned lounge in Dallas.

caused by a direct hit of a Golden Eagle. Repairs included a new one-piece windshield, replacement of cockpit canopy, VOR antenna replacement, rework of instrument panel and nose access panel and new interior. . . . Air Asia is flying two Beech Twins to the Orient after inspection, double-engine changes, interior modifications, Hartzell propeller installations and ferry fuel tanks, with Roy Herold serving as Air Orient's representative. . . . Edgerton, Germeshausen & Grier's Twin-Bonanza was in for radar altimeter, electronics modifications, autopilot overhaul, oxygen system removal and flight test. . . . Don Brady brought in Jacqueline Cochran's Lodestar for tank seal and maintenance. . . . Also in for maintenance were Arch McGregor's General Precision Laboratory DC-4, John Scamahorn's Planes Machinery Twin-Bonanza, Air Oasis' DC-3 and Norm Mitchell's Minneapolis Star Tribune Grumman Gulfstream.

ATLANTIC AVIATION's Lynchburg Division, Preston Glenn Airport, Lynchburg, Va., is the first aviation facility in the northeast coastal states to offer trading stamps with fuel and oil sales, according to Bill Panzarino, manager.

LOCKHEED AIRCRAFT SERVICE, Ontario, California, says it has completed high-altitude flight tests of a pressurization system on a Super Twenty-Six executive conversion of a Douglas B-26 for Mesta Machine Co., Pittsburgh, Pa. The pressurization system holds a 5,000-ft. cabin altitude at 14,500 ft. and 8,000-ft. cabin at more than 19,000 ft. LAS says its flight crew reported handling qualities at stall, cruise and high speeds to be superior to those of the original airplane. An enlarged dorsal fin improved longitudinal stability, it said.

EAST COAST AVIATION CORP., Bedford Airport, Lexington, Mass., had Chief Pilot Dick Carlson's FAA DC-3 in for landing gear hydraulic retracting cylinder replacement and check. . . . Dick Fournier's Pioneer Plastics Aero Commander had all control surfaces replaced and new paint job. . . . Prop modification was performed on Ed Drinan's S. D. Warren Co. Beech. . . . Extensive crash damage repairs were performed on Robert Craig's T. W. Smith Co. Norseman. . . . Seven Army Bell H-13 helicopters were in for extensive major maintenance.

GARRETT CORPORATION'S AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, last month had a record number of 4-engine aircraft on hand simultaneously for modification work — four DC-6's and 2 Viscounts. ASA International Airlines sent in two DC-6A/C's for interior refurbishing, seating for 20 passengers, installation of movable bulkheads, air distribution system modification, lavatory refurbishing and exterior painting. World Airways had a DC-6A in for an interior convertible to first-class, coach or cargo requirements or a combination of the three, additional fuel capacity, navigator's station, RCA-AVQ-10 radar, Sperry A-12 autopilot and exterior painting. . . . Chief Pilot T. W. Hotze brought in Reynold Metals' DC-6B for miscellaneous interior and radio modifications. . . . Mrs. Herbert A. May's Viscount was brought in by Capt. L. Hellensmith from Washington, D. C., for a custom interior and air distribution system modification. Another Viscount, owned by an Eastern firm, was in for an executive interior, cockpit rework, more soundproofing, flight engineer's seat, revamping of air conditioning and pressurization system, transponder, battery system and exterior paint. . . . Mead Johnson & Co.'s Convair 340 was flown in by Chief Pilot E. L. Beard and Henry Weldon for executive interior, super soundproofing and acoustic windows, APU modification, stainless steel exhaust overlay and other service bulletins, cockpit refurbishing, engine

Airmen's Calendar

Aug. 28-Sept. 5—1960 National Air Rally, sponsored by National Aeronautic Association, Municipal Airport, Orange, Mass.

Sept. 4-5—8th Annual Oakland Air Fair, International Airport, Oakland, Calif.

Sept. 5-11—1960 Franborough Flying Display and Exhibition, Farnborough, England.

Sept. 8-9—National OX-5 Convention, Tower Hotel, Dallas.

Sept. 8-9—Engine and Operations Symposium, Airwork Corp., Millville, N. J.

Sept. 10-12—Youth Air Fair, Wirt Field, Newton, Kansas.

Sept. 14-16—National Association of State Aviation Officials Annual Meeting, Wort Hotel, Jackson, Wyo.

Sept. 18—Pacific Festival Air Show, International Airport, San Francisco.

Sept. 20-22—National Business Aircraft Association Annual Meeting, Ambassador Hotel, Los Angeles.

Sept. 21-25—Air Force Association Convention and Aerospace Panorama, San Francisco.

Sept. 25-27—24th Annual International Northwest Aviation Council Convention, Harrison Hot Springs, B. C.

Oct. 6-9—National Pilots Association Annual Meeting, Western Hills Lodge, Wagoner, Okla.

Oct. 18-20—Indiana Turkey Run Aviation Conference, Turkey Run State Park, Marshall, Indiana.

Nov. 3-5—Third Annual Michigan Industry, Missile and Space Conference, sponsored by Michigan Aeronautics and Space Association, Cobo Hall, Detroit.

Nov. 15-17—ADMA's 36th Meeting, Riviera Hotel, Palm Springs, Calif.

Personalized Interiors...

Send today for this informative

FREE booklet

Add VALUE . . . BEAUTY and COMFORT to your aircraft!

Our Interiors Shop is staffed by specialists skilled in the art of providing colorful and comfortable "airborne-offices" for the flying executive. These experienced craftsmen use only genuine hand-dyed leathers and the finest fabrics. Write today for price list and FREE brochure describing our complete one-stop service for single and twin engine aircraft.

Sky Service Interiors

Write P. O. Box 728, Bethany, Oklahoma TULAKES AIRPORT, OKLAHOMA CITY, OKLAHOMA

change and exterior painting. . . . Chief Pilot Howard Baird's Kenaire Corporation Convair 340 came in for increased seating capacity, installation of an executive compartment in the aft cabin area, additional VHF radio and a change to CB-16 engines. . . . Edward Manning, manager of air transportation, accompanied Inland Container's Convair 240 for interior items and engine change. . . . Development Equipment Leasing Corp. brought in its Aero Commander for installation of escape hatch and additional chair and track assembly. . . . AiResearch has a unique new "stinger" power system designed to make Convairs with Napier or Allison turbine engines completely independent of ground support equipment. Installed in the unpressurized tail cone, the AiResearch gas turbine unit can provide pneumatic power, electrical power or combinations of both for engine starting, ground air conditioning or heating, engine pre-heating, pre-flight wing de-icing, electrical power up to 700 amps DC or 60 KVA AC or in a combination of AC and DC output.

EXECUTIVE AIRCRAFT SERVICE, Red Bird Airport, Dallas, received Procter & Gamble's new Grumman Gulfstream propjet executive transport for installation of custom interior and electronics. Chief Pilot U. Nelson Rokes brought the new Grumman in. . . . Forest Oil's DC-3, K. Buis, chief pilot, was in for inspection and miscellaneous work.

NEWARK AIR SERVICE, Newark Airport, N. J., has named Joseph A. Kane assistant general manager. He came from the Port of New York Authority, for which he had been airport lease negotiator and before that was a special FBI agent in the Midwest and Southwest.

HOWARD AERO SERVICE, International Airport, San Antonio, delivered Anderson-Dunham Co.'s Lodestar N-300 to Charlie Viosca, chief pilot, after extensive modifications. . . . Don Dahl accepted delivery of National Steel's Lodestar following Howard 250 conversion and Ben Venable, chief of maintenance for National Steel, is in with the firm's second Lodestar for conversion. . . . Herman Arnspiger brought in Sunray Mid-Continent Oil's Lodestar for 8,000-hr. overhaul, new interior, exterior paint and flap and empennage modification. . . . Harold Smith took delivery of Odom Construction's Twin Beech with engine change, Hartzell propellers, new interior, electronics and exterior paint. . . . Art Stewart's Columbia Gas Lodestar was in for wing overhaul, flap and empennage modification, interior work, exterior paint and other items. . . . Chief Pilot Hub Gayle brought in Copano Oil's Convair for engine nacelle AD note compliance and other work. . . .

Everett Dyer's Republic Steel Super Ventura received repairs, interior paint and radar installation. . . . Air brake installation was performed on Ard Daris's Champlain Oil Super

RADAR SERVICE

headquarters in the **TULSA** area . . .

TULSAIR offers present and prospective radar equipment owners complete sales, installation and maintenance service. Our efficient and prompt service eliminates lengthy ground delays.

At TULSAIR factory trained personnel — using special factory equipment and testing methods — provide superior service for your radar, radio and electronic equipment requirements. Our exacting high standards result in dependable performance under all operating conditions.

Distributors for:

ARC
BENDIX
COLLINS
DARE
MOTOROLA

TULSAIR'S skilled technicians backed with a full line of radar test equipment for the X Band RCA AVQ-50 and the Bendix RDR-1D assure service satisfaction.

DISTRIBUTORS FOR BEECH AIRCRAFT CORPORATION

Tulsair Distributors, Inc.

MUNICIPAL AIRPORT • TULSA 1, OKLAHOMA

BIG ENERGY IN SMALL PACKAGE is illustrated by lead pencil held by pretty Janet Cain of General Electric. GE says pencil has volume comparable to a nuclear aircraft fuel element packing as much power as "thousands" of gallons of jet fuel. GE has operated jet engines hundreds of hours on nuclear power in laboratory tests.

Ventura. . . . Dick Ranaldo, chief pilot, accepted delivery of Petan Company's new Howard 500. . . . Also in the hangar for work were Hoyt Colson's Winn-Dixie Stores' Howard 250, Lew Swick's Jim Walter Corp. Super Ventura, Tommy Teate's Volusia Locations Super Ventura, Dick Yoakam's Ohio Oil Super Ventura, Bob Renneker's Nationwide Mutual Insurance Howard 500, Bob Barrett's Dumas Milner Corp. Lodestar, Joe Snelson's United Transports Super Ventura and Henry Messer's Milner Enterprises Super Ventura.

SPARTAN AIRCRAFT'S AVIATION SERVICE DIVISION, Municipal Airport, Tulsa, performed double engine change for Doyle Eagle's Union Texas Natural Gas Cessna 310. . . . Miscellaneous work was performed on Frank Ernst's Franklin Supply de Havilland Dove. . . . Also in the shop for work were Dr. Lloyd M. Southwick's Spartan 7W, R. W. McMahon's Twin-Bonanza, Kewanee Oil's DC-3 flown by Frank Aurnig, William Welch's Skelly Oil Lodestar, Bill Robinson's Parker Drilling Lodestar, Brown Bridge Mills' Aero Commander and Jack Gibson's Dowell Corp. Beech 18.

L. B. SMITH AIRCRAFT CORP., International Airport, Miami, has established a new sales department known as "Smithair Sales" and directed by Hubert M. Covert, sales manager.

PIEDMONT AVIATION, Smith-Reynolds Airport, Winston-Salem, performed miscellaneous work on Agnew Bahnson's Bahnson Co. Beech Super 18. . . . Also in for work were Harold Farthing's Austin Tobacco Co. Twin-Bonanza, Frank Groat's Hanes Hosier Mills Twin Beech, Roscoe Harris' H. L. Coble Construction Twin Beech and Roy Wakefield's McLean Trucking Co. Twin Beech.

FIELD AVIATION COMPANY of Toronto has completed construction of a 40,000-sq. ft. fireproof aircraft hangar of concrete at its business aviation center on the north side of Malton Airport. It will enable Field Aviation to provide facilities for Beech aircraft sales and service, complete aircraft overhaul, maintenance, servicing and storage. Offices will include a lounge for passengers and visiting executive pilots, a flight planning room and a restaurant.

AVIATION INSTRUMENT MANUFACTURING CORP., Houston, has announced a new pair of air-driven gyro flight instruments, the AIM 400 directional gyro and AIM 500 horizon reference indicator. The "400" includes a flux detector and a combined transistorized amplifier and precision air-driven directional gyro, weighs only 3.6 lbs., fits a standard instrument panel cutout and is about half the size of other air-driven slaved gyro systems. The "500" combines features of the firm's 643-S horizon reference indicator with the added advantage of a manually-operated quick-erect device, is virtually spillproof and is turn-error compensated for standard-rate turns minimizing incorrect readings during flight.

FIRST AMERICAN-PURCHASED CARAVELLE JET AIRLINER has been accepted by General Electric. After a U. S. demonstration tour in cooperation with Sud Aviation of France and Douglas Aircraft, which will sell and service the Caravelle in the U. S. and elsewhere, the twin-jet airliner will be equipped with GE aft-fan engines.

GROWING TO SERVE YOU!

Newly expanded facilities provide MORE efficiency and greater production. For SUPER SERVICE of Top Quality on interiors, electronic systems, overhaul, and maintenance of executive aircraft . . . CALL:

EXECUTIVE AIRCRAFT SERVICE INC.
REDBIRD AIRPORT • DALLAS, TEXAS *L. V. Emery, Pres.*

Arizona's Airport
TUCSON

aero x-ray looks thru metal to find hidden flaws!

Aero X-ray "eyes" quickly spot trouble in aircraft before it starts. An X-ray checkup is fast, sure, complete. It eliminates strip-downs, excess downtime. Call Tom Lombardo for an appointment.

Telephone POplar 1-7721, Atlanta Airport, Atlanta, Georgia.

FAA Certificate 3650

Aero CORPORATION OF **Atlanta**

COMPLETE FACILITIES FOR CONVERSION, MAINTENANCE, OVERHAUL OF AIRCRAFT • HELICOPTERS • ENGINES and PROPELLERS CUSTOM INTERIORS

LEGAL EAGLES gathered in Wichita last month for the first annual meeting of the Lawyer-Pilots Association and are pictured visiting Beech Aircraft. In photo at right, Roy Bley (left) of Beech visits with Ed Marger of Miami Beach, vice president; Albert Rathblott of Camden, N. J., president, and Miss Virginia Hash of Phoenix, secretary. Not pictured is Charles W. Sydnor of Sandston, W. Va., treasurer. Some 50 members of the 300-member pilots organization attended.

ANOTHER RECORD FOR MAX CONRAD, America's premier long-distance airman, was established last month when he took off on July 4 from Minneapolis-St. Paul International Airport in a 180-hp. Piper Comanche and flew 6,921.28 miles non-stop in 60 hrs. 10 mins. around a closed course bounded by Minneapolis, Chicago and Des Moines. His feat more than doubled the existing 3,084-mile 1959 Czech-held world record for Category 3 closed-course distance flying. His Comanche was N-110LF — the same airplane in which he flew 6,967 miles non-stop from Casablanca, Morocco to El Paso in November, 1959, and 7,668 miles non-stop from Casablanca to Los Angeles in June, 1959, for two point-to-point world records. On his latest record hop, Conrad's Comanche grossed 3,858 lbs., carrying 295 gals. of fuel in addition to the airplane's normal 60-gal. capacity, 8 quarts of oil (standard capacity), one Thermos bottle

AS FAITHFUL AS FIDO

An insurance policy can't bark or wag its tail, but in effect it's just as faithful as Fido.

The "U.S. Group", pioneers of "aviation insurance", has shown its friendly protection in an enviable quarter century record of prompt and equitable claim and loss adjustments.

Be sure you have the dependable security of "U.S. Group" insurance. Coverage is quickly arranged through your own agent or broker.

UNITED STATES AVIATION UNDERWRITERS
INCORPORATED
110 WILLIAM ST. • NEW YORK 38, N. Y.

Plenty of Parts for
Convair DC3-C47
Beech Lodestar

A.R.C.	Pratt & Whitney	Accessories
Bendix	Wright	Instruments
Collins	Continental	De-icers, Tires
Sperry	R.C.A.	Standard Parts

Write or Call — Air Express Service

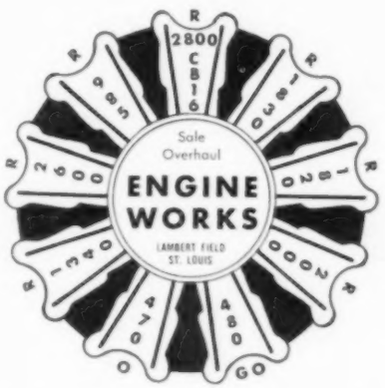
NAVCO Inc.
Lambert Field
St. Louis, Mo.
PErshing 1-1710

each of black coffee, tea and water (no food), and recording barographs. When he landed, he had 40 gals. of fuel remaining. Average fuel consumption was 5.2 gals. per hour and total oil consumption was only 3 quarts. Conrad lost 6 lbs. of weight during the flight.

U. S. PILOTS IN WORLD SOARING CHAMPIONSHIPS conducted recently at Cologne, Germany, placed far down the list in total points scored. Paul Bikle, flying a Schweizer L-23H-15, placed 12th in the standard class, which was won by a German pilot, Heinz Huth, flying a Schleicher Ka. 6 BR, and Richard Johnson, U. S. soaring champion, placed 15th with his teammate, Richard Schreder, placing 16th, in the open class. It was won by an Argentine pilot, Rudolfo Hossinger, flying a British Skylark III. Johnson and Schreder flew high-performance sailplanes of their own design. Weak soaring conditions prevailed, whereas the U. S. designs were intended for strong thermal conditions.

DR. JOHN F. VICTORY, special assistant to the National Aeronautics and Space Administration, retired at the end of July after nearly 52 years of continuous government service.

BELL AEROSPACE CORP., is new name of a group of three defense units purchased recently by Textron, Inc., from the former Bell Aircraft Corp. Harvey Gaylord is president and treasurer of Bell Aerospace Corp., which operates as a wholly-owned subsidiary of Textron. Bell Helicopter Co., Ft. Worth, one of the Bell divisions and formerly headed by Gaylord, is now guided by Edwin J. Ducayet as president. Ducayet was formerly vice president of Bell Helicopter. Other helicopter company officers with Ducayet include James F. Atkins, executive vice president; G. B. Clark, Roy Coleman and Bartram Kelley, vice presidents; Theodore R. Treff, treasurer; and James C. Fuller and Hans Weichsel, Jr. assistant vice presidents.



NOW AVAILABLE

5 BELL DEMONSTRATORS

Here is your opportunity to own a versatile, economical Bell 47J Helicopter in excellent condition . . . loaded with extras . . . plush 4-place interior . . . used by Bell for company transportation and demonstrations . . . serviced only by Bell personnel. Don't miss this chance to save on a Bell.

Write, wire or call Commercial Sales Manager today.

BELL Helicopter Corporation

FORT WORTH, TEXAS

PHONE AT 4-3434 **P. O. BOX 482-A**

EXECUTIVE LOCKHEED

LODESTAR

$37,500

Total time 4200 hours

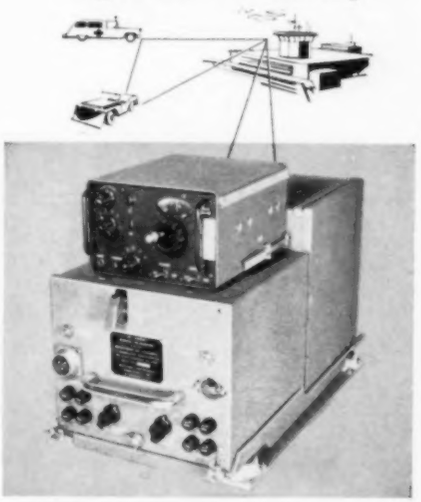
Will accept post-war Beechcraft in trade

For full description write or call

SOUTHERN AIRWAYS COMPANY

Atlanta Airport, Atlanta, Ga., POplar 7-3766

Brings key points together—instantly



NEL 400 Utiliphone

4-channel mobile radio airport-ground control

Now! Special Low Price!

For full information, wire, phone, or write:

National Electronics Laboratories, Inc.

1713 Kalorama Road, N.W.
Washington 9, D.C.

Precision Overhaul + Winslow Oil Filter = Best Available Engine Service

Why not have a "*PRECISION*" overhauled Engine? Available now for Exchange.

PRATT & WHITNEY
R 985-B5 — R 985 AN-14B — R 985-AN 3
R 1340-AN1 — R 1830-92

WRIGHT R 1820-72 *LYCOMING* 0435-C2B *CONTINENTAL* E 225-8 — 0-470 J

PRECISION AEROMOTIVE CORPORATION

International Airport
Houston, Texas
Phone MIssion 5-6636

NORTH PHILADELPHIA AIRPORT

OMNI ON FIELD PNE

110.0 MC ON YOUR DIAL

24 HOUR SERVICE

TEXACO 80-91-100

RESTAURANT • HERTZ CARS • TAXI
MOTELS • ALL CREDIT CARDS • CHARTER

DELAWARE AVIATION

NORTH PHILADELPHIA AIRPORT
PHILADELPHIA 36, PA., HObart 4-1600
Factory Certified Parts & Service

WHAT ?? WHERE HOW MUCH $

THE PLACE TO STOP
RALEIGH-DURHAM
NORTH CAROLINA

IFR HOOD

First in Safety! First in Comfort!
First in Pilot's Choice
The modern method of simulated instrument flight for training and maintaining proficiency.
$15.00 at your Airport or
FRANCIS AVIATION
Box 299 Lansing, Michigan

OXYGEN EQUIPMENT
SALES & SERVICE
REGULATORS—MASKS—VALVES
PORTABLES & CYLINDERS
FIXED INSTALLATIONS
GOVT. APPROVED REPAIR STATION
ZEP AERO Phone: ORegon 8-1161
EL SEGUNDO, CALIFORNIA

FISHING AT ITS BEST

BRITISH COLUMBIA for the finest Rainbow Trout fishing in the world. Come to the fabulous RAINBOW CHAIN near Kamloops, B. C., by private plane or by airlines. Floatplanes available to inaccessible lakes. Accommodations perfect, including new cabins with electric lights and all modern conveniences.

Call or write

SANTA MONICA AVIATION, INC.
3011 Airport Ave. Santa Monica, Calif.
Tel. # EXmont 8-2701

YOU — Will be surprised!
YES — We're sure you will be!
WHEN — You see what a "buck" or a hundred "bucks" will buy in our NEW 1960 Catalog of Sport Parachuting Equipment. Bargains! It's loaded!

FILL OUT AND MAIL COUPON TODAY
—Please Print—
Send 1960 Bargain Catalog to:

NAME_____
ADDRESS_____
CITY_____ STATE_____

McELFISH PARACHUTE SERVICE
2615 Love Field Drive
Dallas 35, Texas

WE BUY TWINS
CASH NOT CONVERSATION
THERE IS A DIFFERENCE!

One or complete dealer stocks, new or used. We'll buy over the phone. No Red Tape. We pick up. Send for our free list of buys.

VEST AIRCRAFT CO.
Box 5306
EM 6-2663 Denver, Colo.

SPRINGER BLACK BOX
Crystal Tuning for ARC Type 15 Systems
SPRINGER AIRCRAFT RADIO CORP.
Indianapolis 19, Indiana

Aircraft Title Searches
Airmen Record Information
Recording Services
AERO RECORDS & TITLE CO.
CRAVENS BLDG.
OKLAHOMA CITY, OKLA. CEntral 9-2507

CONVAIRS

Airline and Executive configuration. Long or short term leases available.

WELSCH AVIATION CO.
60 E. 42nd St., New York 17, N. Y.
MUrray Hill 7-5884

PBY 5A
Two amphibians converted for 2 crew — cargo — passenger use.
P. O. Box 750 "B"
Flight Magazine, Dallas, Texas

EXECUTIVE
DeHAVILLAND DOVE
TOTAL TIME 1146 HRS.
P. O. Box 750 "E"
Flight Magazine, Dallas, Texas

Piper PA23 Apache — $13,885
Two Narco omnis, ADF-12, glideslope, Grimes lights, flight group, flares, DayGlo trim. Closing out lien, first cash takes. Box 64, Bridgeton, Missouri. THornwall 8-3428.

Hiller UH12 Helicopter — $12,885
Low time, dual control, new upholstery, A.R.C. VHF transmitter & receiver. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

D18S Twin Beech — $17,885
Not military. Painted exterior, excellent interior, 3 seats, divan, table. Hydromatic props, nose tank, de-icer boots, prop alcohol, oleo drag legs, Grimes beacon, eyebrow lights, two omnis, VHF transceiver, A.R.C. standby VHF transmitter, LF range receiver, ILS, marker, HF transmitter, BC receiver, speaker, etc. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

B50 Twin Bonanza — $22,885
Two A.R.C. omnis with Course Director, VHF transceiver, A.R.C. standby VHF transmitter, ADF-12, 3 light marker. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

---

520 Aero Commander — $23,885
De-icer boots, Collins 51R3 omni, A.R.C. 15D omni, ADF-12, ADF-14, Dare 180/360 transceiver, A.R.C. T-11 VHF glideslope, marker. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

1956 Aero Commander 680 — $42,500
Low time. Big generators, new tires, two beacons, 7 seats, hassock with icebox, table, fan, speaker, reading lights. Grimes lights, dual flight group, Collins 17L-51 VHF transceiver. Collins 51R omni, A.R.C. omni, A.R.C. T21 VHF, dual ADF-14, Collins 51Z marker, etc. Like new. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

D18S Twin Beech — $29,885
New interior, NTSO engines, hydromatic props, de-icer boots, prop and windshield alcohol, beacon, 80 gallon nose tanks, nose light, two A.R.C. omnis, ADF, range receiver, glideslope, marker, 36 channel VHF transceiver, A.R.C. T-11, isolation amplifier, eyebrow lights, cabin speaker, five chairs, two tables, cabin radio, interphone, fans, etc. Not military. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

DC3 — Excellent interior, painted exterior, 4 single chairs, 8 doubles, jump seat, lavatory, tables, fans, cabin heater, dual panel, dual hydraulics, wheel well doors, airstair door with hydraulic strut, four tanks, 360 channel VHF transceiver, 50 channel VHF, two Collins 51R omnis, ILS, ADF, LF, marker, boots, alcohol, etc. $49,500. Closing out lien, first cash takes. Box 64, Bridgeton, Mo. THornwall 8-3428

EXECUTIVE AIRCRAFT ON DISPLAY...

St. Louis, Lambert Field — Call PErshing 1-2260

Convair Specials

See the CA18 Convair — 300 mph. with 5,500 pound or more payload at 7,500' cabin altitude. Low purchase cost and low maintenance. Light, economical engines, inexpensive to buy and overhaul. Rear entrance for better weight distribution and more efficient space usage, large, easily loaded cargo compartments. Long range tanks if desired. Available immediately in airline or executive form, or will custom convert to your specs. Also available with CB16 engines at same prices. See in St. Louis.

CA18 Convair — Deluxe executive interior. Ferry time only since OH on engine, props. Engine Analyzer. Excellent condition. One of finest new conversions in country. At St. Louis.

CA18 Convair —40 seat airline interior, rear entrance, flyaway St. Louis, $175,000.

CB16 Convair — NTSO airframe, props, and CB16 engines, 40 seat airline interior, rear entrance. See in St. Louis.

Convair & Martin Engineering — and/or installation of autopilot, radar, radome, wing tanks, and other features in Convair 240, 340, 440, and Martin 4-0-4.

Convair Parts, Engines, Props — over $1,000,000 worth just received in our own warehouses, available to you at low dealer prices. Write for our list.

Super-92 DC3 — Deluxe executive, fresh NTSO overhaul. RW landing, gear doors, luxurious interior with picture windows. Radome, dual Collins omnis, custom panels. New ship guarantee. At St. Louis, $179,500.

C-47 — Cargo-passenger. NTSO P&W engines, cargo door, 30 seats fold for cargo, heavy gear with RW gear doors. New paint, Collins omni, etc. At St. Louis, $79,500.

DC3 — RW gear doors, Hayes brakes, new paint, new interior with 8 double chairs, 4 single, 3 tables, aux. heater, etc. Dual hydraulic system, dual instrumentation, etc. At St. Louis, $69,500.

DC3s — Others also available. Can certify for FAA Part #42 or #45, and help prepare manual.

Grumman Goose — Low time, recent engine OH and deluxe executive conversion, Hartzell props, metal wings, omni, VHF, ADF, LF, etc. At St. Louis.

520 Aero Commander — Collins 51R3, omni de-icers, 5 seats, 5700 gross. At St. Louis, $25,000.

680 Aero Commander Super — Like new, low time. 7 seats, dual panel, Collins VHF, 51R, omni, oxygen, etc. At St. Louis, $45,000.

Apache — Just in. Dual omni, ADF, ILS, Grimes, etc. At St. Louis, $15,885.

680 Aero Commander — 7 place, radome nose, dual panel, H-5 Horizon, Collins 17L8-51X3 VHF, A.R.C. 210 VHF, dual A.R.C. omni, dual A.R.C. 21 ADF, CDI Course Director, isoamp. At St. Louis, $49,500.

UH12A Hillercopter — Custom interior, dual controls, VHF, etc. At St. Louis, $16,500.

S-51 Sikorsky Helicopter — Low component time. Flyaway St. Louis, $9,850.

S51 Helicopter — Executive, plush interior, NTSO engine, St. Louis, $35,000.

Custom 18 Twin Beech — **1953 Model.** Fresh NTSO airframe, engines, hydromatics, with all AD Notes. Gear doors, airstairs, large picture windows, enlarged cabin, Custom 18 interior, Collins omni, gyrosyn compass, A.R.C. 210 VHF, electric T&B, many extras. A beautiful airplane with new ship guarantee, less than a third the cost of new. At St. Louis, $49,500.

D18S Twin Beech —1950 model. Fresh NTSO engines, hydromatic props, 80 gal. nose tank, dual omni, de-icers, excellent interior, cabin radio. At St. Louis, $29,885.

D18S Twin Beech — 1953 model, hydromatics, Collins 17L8-51X3 VHF, dual omni, new interior, couch, 3 seats, cabin instruments and speaker, 80 gal. nose tank. At St. Louis, $29,885.

D18S Twin Beech — Excellent interior, de-icers, hydromatics, 80 gal. nose tank, cabin radio, dual omni, HF, etc. At St. Louis, $22,885.

B50 Twin Bonanza — Just traded in. Dual omni, Course Director, VHF, ADF, etc. Very clean inside and out. At St. Louis, $25,000.

Also DC3s and D18Ss for short or long term wet or dry lease

Remmert-Werner

St. Louis	Florida	Toledo	Trenton
Lambert Field	Pompano Airport	Express Airport	Mercer Airport
PErshing 1-2260	WEbster 3-4516	UNiversity 5-2328	TUxedo 2-6500

AIRFRAME • MODIFICATION • ENGINES • ELECTRONICS • RADIO • RADAR • INSTRUMENTS • ENGINEERING • DESIGN • FABRICATION • INTER O
PAINTING • PROPELLORS • EXPERIMENTAL • CONSULTING • ACCESSORIES • INSPECTION • SERVICE • TANK SEALING • MANUFACTU RI

EXPERIENCED
TRAINED
READY

The Power Behind

43 *aircraft—from single engine to multi-engine turbo props—cleared through IA inspectors during the first six months of 1960 are evidence in action of IA 's first line performance in all of the intricate requirements demanded by business aircraft owners today.

*VISCOUNT	1	GULFSTREAM	6
F-27	5	TWIN BEECH	7
DOVE	4	DC-3	5
C-46	1	AERO COMMANDER	5
LODESTAR	3	MISCELLANEOUS	6
		TOTAL	43

IA

INTER-AMERICA AVIATION
MODIFICATION CENTER
MEACHAM FIELD, FT. WORTH, TEXAS

FOR INTERNATIONALLY ACCLAIMED MAINTENANCE, MODIFICATION AND OVERHAUL, CALL MArket 4-8416 OR WRITE: RAY BECK, GENERAL MANAGER

AIRFRAME • MODIFICATION • ENGINES • ELECTRONICS • RADIO • RADAR • INSTRUMENTS • ENGINEERING • DESIGN • FABRICATION • INTERIO
PAINTING • PROPELLORS • EXPERIMENTAL • CONSULTING • ACCESSORIES • INSPECTION • SERVICE • TANK SEALING • MANUFACTURI